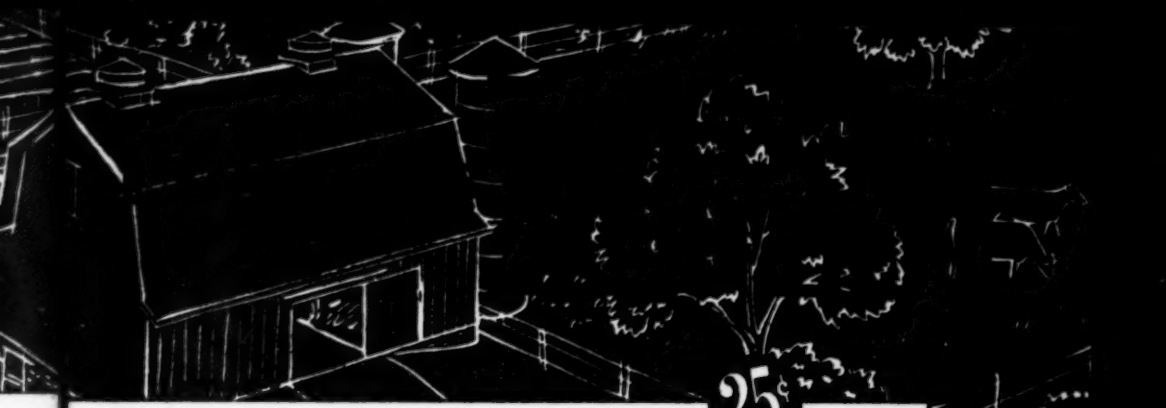

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Contents for October 1952

How I Get Organic Matter Quick	Successful Farming	1
He Feeds Everything That Grows	The Farmer	5
Land Judging Contest Goes National*	Oklahoma Extension Review	7
What's Ahead for Dairymen	American Agriculturist	8
New Antibiotic Pig Pellet	Better Farming Methods	11
Hogs, Feeder Cattle vs. Dairy Cattle*	University of Minnesota	15
Gozzis' Turkeys Sell at Retail	Turkey World	16
A Summer on Danish Farms	The Nation's Agriculture	19
Banded Fertilizer for Legumes	Pennsylvania Farmer	23
Breeding and Feeding for Wool	Sheep Breeder	27
Irrigate Pastures	Ohio Farmer	32
Report on X-Disease*	University of Virginia	53
Take Advantage of the Cow's Architecture	Holstein-Friesian World	35
Bossy a Crook? Nose-Print Her	Farm Journal	38
Honey, There's Plenty of Honey	Marketing Activities	39
Report on Weed Killers*	Extension Service	42
A Valley Is Reclaimed	Rural New Yorker	43
What It Costs to Harvest Grass Silage	Iowa Farm Science	47
Mother Earth Can Take a Big Drink	Agricultural Engineering	51
New Promise for Artificial Breeding*	University of Wisconsin	34
Balbo Rye—Two Cans a Day Extra	New Jersey Farm and Garden	54
All-Risk Crop Insurance	Agricultural Situation	55
Pastured Pork Costs Less	Eastern States Co-operator	59
Pole Type Poultry Shelter	American Poultry Journal	63
New Cure for Trichomoniasis	The Ayrshire Digest	66
Michigan's 4-H Fair Goes to College	Capper's Farmer	71
Cascade Lotus, Promising New Legume	Soil Conservation	74
Bossy's Body Heat Warms Wash Water	Agricultural Engineering	77
12 Poultry Practices That Pay	Poultry Tribune	79
Will Feeder Cattle Pay in '53?	Michigan Farm Economics	83
How We Make Beef for 14 Cents	Farm Journal	86
Planning for Greater Dairy Profits	Michigan Farm Economics	89
Biggest Cross-Roads Bank	Wall Street Journal	92

* Short Features: A few of the many in this issue.

The Farmer's Digest

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October is a time of the year when you can start thinking about next year's crops and operations. That is why, in this October issue of Farmer's Digest, we give you more articles on general farm management . . . about prices, forecasts, insurance and the like. We believe you will find them helpful.

Every worth while thing you read about farming helps to make your judgment more sound, makes you more alert to new opportunities, gives you ideas you can use to your profit. No one can do your reading—and learning—for you. But we believe Farmer's Digest makes it easier.

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State of Wisconsin } SS
County of Jefferson }

Before me, a Notary Public in and for the State and County aforesaid, personally appeared Hugh Highsmith, who being duly sworn according to law, deposes and says that he is the publisher of the Farmer's Digest and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, and July 2, 1946, embodied in section 537, Postal Laws and Regulations, to wit:
1. That the names and addresses of the publisher and digest editor are: Publisher, Hugh Highsmith, Fort Atkinson, Wis.; editor, L. Bush-Brown, Ambler, Pa.
2. That the sole owner is Hugh Highsmith, Fort Atkinson, Wis.
3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: none. Signed, Hugh Highsmith, Publisher.
Sworn to and subscribed before me this 15th day of September, 1952 (Seal). Ormal E. Kiesling, Notary Public. [My commission expires September 18, 1955.]

The Farmers Digest
Volume 16 October 1952 Number 4

How I Get Organic Matter — QUICK!

Condensed From
Successful Farming

Louis Bromfield

I HAVE heard a great truth uttered many times — that it takes Nature 10,000 years to build an inch of topsoil. But I have rarely heard it said that *man could build 10 inches of topsoil in 10 years* (and profit while doing it) by the *same* process which Nature employs!

It took Nature a long time to build an inch of topsoil, because she followed, of necessity, the painfully slow process of laying down one leaf or one blade of grass at a time. The good farmer has a huge variety of heavy legumes and grasses—which may be used as cover crops, green manure, and profitable heavy pasture, and turned into the subsoil. Topsoil is nothing more than subsoil thoroughly mixed with decayed and decaying organic material, plus the benevolent acids, the bacteria, and the spongelike moisture-holding qualities of humus. All these make for quickly available fertility, high yields, healthy plants, animals, and people.

If the subsoil contains a good balance of minerals, the topsoil, built by man, will be one of the richest and most productive on earth. If the mineral balance isn't all it should be, we now have means of testing the soil, discovering deficiencies, and correcting them.

Man also has invented tractors and a wide variety of machinery and tillage tools which permit him to incorporate organic material into the soil. When all

Reprinted by permission from Successful Farming,
Des Moines, Iowa

these factors are added together, two things become apparent: (1) Man can build good, deep topsoil out of almost any basic material. The only limitation is the one of cost.

The original land at Malabar Farm was partly abandoned. The part of it that was being farmed was declining in production each year, while the gullies grew deeper and deeper. We were told that the land, especially the hilly parts, was fit only for reforestation or Christmas trees. We didn't believe it—so we decided to find out how to do the restoration job just as quickly and economically as possible.

Our main practice ground was our biggest hill. For 40 years it had been known as Poverty Nob. It was steep; its sides were deeply gullied. It had been corned out, farmed out, pastured out, sheeped out, and abandoned about the time I was born. Since that time it provided weed pasture for a handful of cows for about 10 days each spring.

We began experimenting on the lower slopes of Poverty Nob, seeding in a nurse crop. We limed the field, plowed in the gullies with a moldboard plow, fertilized, fitted the harsh soil carefully, and seeded it down to alfalfa, bromegrass, and Ladino clover with a nurse crop of three bushels of oats to an acre.

The result was disaster. The smoothly fitted field washed badly with the first rain, carrying away much of the grass-legume seeding. Later in the summer, when dry weather came, the cementlike soil (devoid of all organic material) held no moisture at all. The few seedlings that survived the washing rains were burned out. The nurse crop of oats could not profit by the fertilizer and grew only six to eight inches high.

Very clearly, this was not the way to get a seeding and build topsoil. (Incidentally—five years later we took a yield of 75 bushels of good, solid oats off the same field.)

That autumn, merely to get some kind of cover for the winter, we sowed the field to Balbo rye with another 300 pounds of fertilizer. Rye is a tough plant, but, while it did better than the oats, it was still pretty scrubby by the following spring. This time, instead of plowing and fitting the field, we tried a trash-mulch system. We went over the field with a disc and tiller (a kind of light field cultivator, ideal for working in a trash mulch). The field was not worked more than three or four inches deep, but the soil was thoroughly mixed with the trash made by the rye and a hearty crop of weeds. Then came another seeding of alfalfa, bromegrass, and Ladino.

What happened was very nearly a miracle. The trashy surface

prevented rainfall from running off. Virtually every seed put on the field germinated and, with them, billions of seeds we had *not* sowed.

We mowed the weeds when they were in flower and again in August. Again a miracle occurred. The mowed weeds served as a mulch for the seedlings, retaining the moisture and keeping the ground cool. It was the best grass and legume seeding we had ever had.

The following spring, we had a rich, green, heavy crop of alfalfa-brome-Ladino. It provided us with a first cutting for hay and silage and rich pasture.

Then we asked ourselves a question. If we can use rye and weeds for a mulch seeding, why not use the broom sedge, poverty grass, blackberries, elderberries, and saplings? We tried this the next season. Again, we used a disc and tiller until we had a fairly even trash mulch. But it was still too rough for our tastes, and there were a lot of bushes, saplings and goldenrod that were not killed. Also, it was expensive in terms of man-hours and gasoline. In order to get any sort of job we had to go over the field eight or nine times.

So we decided to try the rotary tiller. It killed and demolished everything up to saplings two inches in diameter, reducing it all to organic trash. It can be a dangerous tool to use for fitting, especially if used thoughtlessly in soils low in organic materials, for its fast and violent action might destroy the remaining structure of the soil. We did not use it, however, to fit a field in the usual way; we set it only two or three inches deep to create a trash mulch of weeds and rubbish.

During all the freezing and thawing, the snow and the heavy rains of winter, water did not run off the steep slopes of Poverty Nob.

In the spring, we went over it once with an offset disc to freshen up the surface and kill the first germinating weed seeds. Then, with 400 pounds of 3-12-12, we seeded the usual mixture of grass and legumes and mowed down the weeds twice during the summer. The following spring, Poverty Nob was dark green and thick with pasture to the very top.

The whole process, including gas, seed, fertilizer and the amortization of machinery, cost us roughly $35 an acre. In the first year of production we took off the equivalent of $75 to $100 per acre in terms of pasture, hay and silage.

This was, however, only the first step of a fundamental process which we extended, in an adapted form, to our cropland. We used the multiple-chisel-type plow, which is really a strong and heavy field cultivator, capable of

tilling and fitting land to a maximum depth of nearly two feet. On the cropland, the rotary tiller again came into use to break up the very heavy sods which came on fields after six to eight years of alfalfa, brome and Ladino.

The leveling and mixing action of an offset disc further mixes sod, roots, manure and green growth, and completes the fitting of the field. This gives us a compost, ranging from 15 to over 20 inches deep, in which we grow our small grains and corn.

The whole story is not one of machinery alone but also of selectivity in grasses, legumes and the right fertilizers. Our subsoils are largely of glacial origin and minerally well balanced. Once we came to understand this, we stopped seeding shallow rooted legumes and grasses and replaced them in seedings with only the heavy, deep-rooted grasses and legumes such as sweet clover, alfalfa, bromegrass, orchard grass and fescue. We continue to seed Ladino in mixtures, both in meadows and pasture, because of its high nitrogen production, high protein and heavy pasture production.

A striking thing has happened and is happening at Malabar Farm. We have built or are building topsoil *deeper than the original virgin forest soil.* Added to green manure, the heavy root systems and heavy sods that are constantly being turned back into the soil are huge quantities of barnyard manure. Each year we have produced more forage, carried more animals, produced more manure, increased the depth of topsoil, and, in turn, increased production. The only outside element is the application of lime, when needed, and of commercial fertilizer in quantity sufficient to balance the amounts of minerals carried off the farm in the form of milk, meat, wool, hides and hair.

GOOSE RESEARCH — Prior to 1945, commercial hatcheries would not try to hatch goose eggs. Now a modified incubator turns eggs a full 180 degrees four times a day and latest research shows spraying eggs with warm water increases hatchability 45 per cent. Recommended hatching temperature is 99¾ degrees. Geese now keep grass out of southern cotton fields. In one Arkansas county alone, 60,000 geese waddle through eating the grass and leaving the cotton. Strawberry producers and orchardists also use geese to kill grass. But goose men say they are not weeders. They eat grass but won't eat weeds.

He Feeds Everything That Grows

Condensed From The Farmer

William H. Kircher

CLARENCE FESTE looks with a calculating eye at everything that appears above ground on the 240 acre farm he rents from his father in Murray County, Minnesota.

For example, he figures there ought to be more value in oats than the grain and the straw for bedding, and he proves that there is. He has been putting cheap gains on steers with oat hay, cut when the grain is in the soft dough stage.

And corn cobs. A man who has cattle to feed should feed more cobs than he can produce on the place he farms. There is dirt cheap gain in cobs, Feste has proved.

Hay and pasture make more money on the Feste farm than one would guess possible. Would $122 an acre seem to be a reasonable figure for pasture? That's conservative for what Clarence Feste got from each of 80 acres in brome and alfalfa last season.

This young farmer's way of farming makes sense . . . and money. His and his wife's farming business consists of the 240 acres they rent, about 130 head of feeder steers, 300 or so hogs, and about 1,000 chickens. But to see what makes this business tick, you have to look at its separate parts. Take the main part of it first: Cattle.

Starting with 30 head of stock heifers four years ago, Feste has felt his way until now he is sure that there is much more to be known about how to put cheap gain on a steer than he has learned. Meanwhile, he is doing well with cattle.

That $122 per acre return from pasture was made on beef gain last summer. Whatever else was wrong with last year's growing season—and there was plenty—it was a great year for brome and alfalfa growth, even though it was a poor year for hay making.

Feste put a fence through 80 acres of brome and alfalfa, and rotated grazing through the summer. He turned 125 head of yearling steers on it May 10 and took them out September 20. Average per head gain was 230 pounds. He got 34c a pound for the cattle, so the value of that

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gain totaled $9,775 or a little more than $122 per acre.

With all the lush pasture, some trouble with bloat was to have been expected, and such trouble developed. Feste lost four head of cattle in one day. Immediately after that experience he bought 204 bales of old wild hay and ground it with corn. He used five bushels of corn to a tank wagon load of ground hay. He fed that mixture morning and evening and experienced no more trouble with bloat.

The $122 per acre figure does not tell the whole story of the meadow's value. Feste pastured his sows from the time pasture season started. Just before the first were to farrow in July he took partitions from his hog house, laid them on the ground in the pasture, scattered straw on them and the sows farrowed in the open. Average number of pigs saved per litter was a little more than seven. From July on, more than 300 pigs were pastured with the cattle. In addition, he put 1,000 growing pullets on the pasture.

But even the combination of all the livestock and poultry couldn't keep the alfalfa brome short enough to provide the best grazing so he took a cutting off 40 of the 80 acres, and put it up as grass silage. There was enough of that to run the beef herd six weeks in the fall.

With pork and poultry gain added to the beef gain plus the fall beef gain from the grass silage, the return from the 80 acres of brome and alfalfa was probably nearer $160 per acre than $122.

Necessary tool for Feste's way of farming is a field forage harvester. Not an ear of corn was picked on the place last fall. All the corn from 80 acres was field chopped and blown into a 550 ton stack in the middle of the feedlot. Feed bunks were put around it and the silage shoved down into the bunks through the winter. Feste figured there was enough silage to last his cattle until May 10.

Feste threshes only enough oats to provide straw for bedding. Instead of shocking the remainder, he swaths the oats, picks it up with a field forage harvester, hauls it to the threshing machine at the barn, and blows the straw into the barn where it is convenient for use.

That part of the oat crop not needed for straw is swathed just before it r i p e n s, then field chopped and fed as oat hay. That chopped oat hay, the ensilage, and a protein concentrate make up the cattle ration fed all winter.

Cobs were fed last spring when the ensilage supply ran low. Feste hauled in load after load of cobs, soaked them down with water and ground them with corn. The

proportion of cobs to corn was about seven times more than there would be in ordinary corn and cob meal. His cattle did well on the mixture.

Feste's way of making cheap gains could add up to the difference between profit and loss on many a farm.

Land Judging Contest Goes National

Land judging contests and land appreciation training schools, started in Oklahoma 11 years ago, are now launched as a national contest.

"The idea of land judging contests was patterned after the livestock judging contests which have glamourized the livestock business through judging contests and shows," says Mr. Roberts, Oklahoma's extension soil conservationist, who has trained 40,000 people in land judging and land appreciation schools in the past four years.

"Briefly the system calls for participants to judge four different fields or pieces of land. They walk about it, examine the contour, top soil and slope. They judge the texture of the soil, which means the size of the soil particles and amount of clay in it. They pick up samples of the soil, and look at it for permeability of subsoil, the toughness, or ability for air and water to filter in. They squat around a hole which has been spaded into the ground down through the top soil, and examine it for depth of the soil, just as boys are taught to look for plenty of capacity in the barrel of a good dairy cow. This determines root penetration, the capacity of the soil to hold water and plant food. They look at the amount of slope, determine how much erosion has occured, the drainage condition of the soil and, finally, determine the land class, or catalog it according to its capability.

All of these factors are sized up, the contestants make their decisions and check them on sheets of paper with multiple answers, and they are scored, much as a livestock judging team is scored. The highest scores determine the winners.

Oklahoma Extension Service Review

What's Ahead for Dairymen

Condensed From American Agriculturist

L. C. Cunningham

Cornell University

DAIRY farmers are experiencing the 12th year of rising prices and rising costs in their business operations. Five dollars a hundredweight for milk is no longer a dream, nor is $100 a ton for feed or $50 a week for hired men's wages.

Another characteristic of the present situation is the shift from a live-at-home subsistence kind of farming to highly commercialized operations—the buying of large amounts of materials and services and, in turn, the selling of lots of product-milk.

The dollar inventory of the farm business is at a record-high level. Even under average conditions this investment, including the farm itself and the stock and tools, is at least $1,000 per cow. That is, a 25 cow farm would have an investment of $25,000. On good farms, it is not uncommon to find an inventory of $1,500 to $2,000 per cow.

Faster Turnover

In striking contrast to even a generation ago, it takes only two years for the annual receipts on a dairy farm to equal the total capital investment. As our accountant friends would say, the capital turnover is two years. Only a decade or so ago, four or five years were required for annual receipts to equal capital.

Equally if not more important, in this financial picture of dairy farms at present, is the fact that the cash expenses for feed, hired labor, taxes, repairs, and the like, are equal to about 75 per cent of the cash receipts.

Dairy farms will continue as family operated units. The farmer and his family will continue to be the core of the labor force. The few large incorporated dairy farms attract considerable attention, but they do not indicate the future trend of ownership and operation.

Home Grown Feed

Even by 1960, and the years

Reprinted by permission from the American Agriculturist, Ithaca, New York

beyond for that matter, at least three-fourths of the total feed nutrients — pasture, hay, silage and grain—will be produced on the farms where the cattle are kept. If not, the dairy farm may lose out in the competitive struggle. On the basis of the market prices for the past 12 months, the cost of 100 pounds of digestible nutrients from each major source was as follows: Grain, $6; hay, $1.75; silage, $3.25, and pasture, $1.50.

Most of the dairy farms by 1960 will still have the cows in stanchions or tie stalls, despite some of the advantages of a pen stable. I believe the conventional stables will continue in common practice because: 1. The saving in labor in the pen stable versus the stanchion barn is not great; 2. There is little difference in disease control; 3. There is a lack of adequate bedding for pen stabling.

More Cows

By 1960, dairy farm businesses generally will be larger in size. During the past decade, the production per day per dairy has increased 18 per cent in this region. A recent study at Cornell of large dairy farms shows that there was a rapid increase in efficiency as the size of herd increased through the range of 20, 30 and 40 cow herds and up to about 50 cows. Beyond that size, the curve of efficiency tended to level off.

The dairy farms of 1960 will have higher milk production per cow than those of today. Milk production per cow in New York state has been increasing at the average rate of about 40 pounds per cow per year. With our greatly improved breeding programs, it is entirely possible that this rate of increase might be even faster in the years ahead. Associated with this increase in annual milk production per cow, the dairy farms of 1960 will produce a higher proportion of winter milk than at present.

Less Lifting

Another important change on dairy farms of the future is that there will be less lifting and the job will be easier physically. On a 25 cow farm at present a worker lifts about 500 tons during the course of the year. To feed the cows he lifts 30 tons of grain, 100 tons of silage and 60 tons of hay; he handles 25 tons of bedding; he lifts 200 tons of manure; he picks up 100 tons of milk.

Notwithstanding the advances that have been made to date, the dairy farms of 1960 are going to have even more mechanical equipment. Currently dairy farmers are in a sort of transition with respect to harvesting equipment.

Pickup balers have become quite common and field choppers are being used in increasing numbers. On some farms both of these pieces of harvesting equipment

are in use. Along with balers and field choppers, there are many other pieces of equipment, including hay crushers, blowers, bale elevators, hay hoists, wagons that can be unloaded mechanically, and so on.

In the dairy stable, the mechanical gutter cleaner is rapidly passing through the experimental stage and developing into a practical piece of equipment which will save a lot of hard work.

The bulk handling of milk is perhaps less common than is the gutter cleaner in this region. Nevertheless, based on observations of what is happening in eastern New York, here is another change that is likely to take place in this and other dairy areas.

Still another change that we may see made on dairy farms by 1960 relates to the handling of purchased feed. The conventional way of handling feed involves the use of sacks and considerable lifting. In a few areas in the New York milk shed, bulk feed trucks and bulk storage bins on farms are being experimented with to determine what savings in cost and chore time can be made by handling feed in bulk. Incidentally, many of those who are using bulk feed at present state that the convenience and the saving in labor mean more than the saving in the cost of bags.

Commercial Farming

Another change in dairy farming that will be more strikingly evident by 1960 is the change in attitude toward dairy farming itself. Certainly in years past dairy farming was considered almost as much a way of living as it was a business. As education and means of communication have increased, this attitude has changed. It will continue to change toward regarding it as a commercial farm business.

By 1960, some 200,000 pounds of milk produced per man per year will be as common as 150,000 pounds per man at present. Furthermore, the efficient dairy farms of 1960 will be producing this larger amount of milk with less physical effort than is expected at present.

Finally, with less lifting and other physical exertion, more brains will be required to run the dairy farm of 1960, and the need for up-to-date information about crops and cows and related subjects will be even greater.

SMALL TRACK-TYPE TRACTORS are favored by farmers in hilly parts of Kentucky, county agents report. Owners say they are safer on hillsides, lose no power by slipping, are more economical to operate, and can be used in some fields where wheel tractors can't operate.

New Pig Pellet

Brings Benefits of Antibiotics to Suckling Pigs

Condensed From

Better Farming Methods

EVERY pig that dies at farrowing costs the farmer about $5.50! Based on today's production costs, a pig that dies near weaning costs the farmer at least $11! Furthermore, stunted and runty pigs are an economic handicap, and countless more dollars are lost on these unthrifty pigs.

Farmers lose about 25 per cent of their pigs between farrowing and weaning. According to Damon Catron, noted swine nutritionist, Iowa State college, 50 per cent of all pigs lost from farrowing until weaning die during the first few days.

To help the average hog producer reduce his baby pig losses, college and industrial research men are constantly developing new products and new applications of old products to reduce this high mortality.

Now comes a new method of utilizing an antibiotic, bacitracin, which will help the farmer not only grow more pigs, but grow them faster and more economically.

The first practical antibiotic, and the one most widely used today in pharmaceutical and veterinary work, is penicillin. The production of penicillin was developed during World War II. Commercial Solvents Corporation was responsible for developing a method of producing this antibiotic on a mass scale.

Following this initial development of the first practical antibiotic, research men soon isolated others. Growth stimulating characteristics of certain antibiotics were discovered. Residues left after the extraction of pure antibiotics were found to give increased chick growth. From this discovery it was but a short time until scientists found that the growth stimulation was caused by the traces of antibiotic left in the residues. Bacitracin and penicillin proved to be two of the most effective antibiotics for giving animal growth response.

Reprinted by permission from Better Farming Methods, Mount Morris, Illinois

The first work with antibiotics in the animal nutrition field was carried on with chickens. Hogs next received attention. Calves and other animals were also used in experiments. To date, poultry and hogs have responded best to antibiotics, and use of antibiotics in manufactured feeds has become commonplace.

The development and use of antibiotics in hog production has occurred mainly during the last three years. The reason why such antibiotics give increased growth in hogs is not known exactly. The most popular theory, and now significantly substantiated by experiments at the Lobund Institute at Notre Dame university, appears to be that the increased growth is due to the alteration of bacteria flora within the intestines of the animals.

Antibiotics do not always give an increased growth in hogs—or in poultry. But in the majority of the tests run they do stimulate growth and improve feed efficiency.

Swine nutritionists have formulated antibiotic sow gestation rations that will produce large litters of strong pigs. They have used antibiotics in good pig starters to prevent scours and promote growth. But, for the farmer following time tested and approved swine management practices, there is a period from the time the pig is farrowed until it starts eating adequate amounts of dry pig starters when there has been no way to furnish adequate amounts of antibiotics to promote growth.

The development of bacitracin pellets is designed to meet this need.

Bacitracin is an antibiotic that stimulates growth in hogs. It was discovered in 1943 by Dr. Frank Meleney, Columbia university. In 1947, Commercial Solvents Corporation worked out a process to produce it. Full production was achieved in 1948 for use as a pharmaceutical.

Early in 1951, it was used commercially in many feeds and sold to leading feed manufacturers throughout the country. The trade name was Baciferm. Later, Commercial Solvents developed an antibiotic feed mixture combining both bacitracin and penicillin. The combination was called Penbac and has proved highly successful. Both products are widely used today.

Farmers have accepted the value of antibiotics in hog production. They creep feed their pigs using a starter containing aitibiotics. They feed their breeding stock a feed containing antibiotics. However, up to the present time, *farmers have not been able to supply pigs with sufficient antibiotics from farrowing to weaning time and still raise them with a minimum investment in*

time, labor and equipment while utilizing the sow and her milk.

A sow could be fed extra high levels of antibiotic feeds, but so much had to be fed to the sow to get an appreciable amount in the milk flow that it was not practical. It cost too much.

A baby pig is at least three to four weeks old before it will eat enough dry feed to get the minimum requirements of antibiotics.

This obstacle has now been overcome through the development and use of a pellet containing the antibiotic, bacitracin. This pellet is administered to pigs at farrowing time and supplies the needed antibiotic during the very early critical period.

Research workers had shown that baby pigs would gain in weight through the suckling period when bacitracin was injected into them, but repeated injections had to be made, one every 48 hours. What was needed was a method of supplying the antibiotic over the desired period with one implanting.

A pellet was the answer. Dr. E. L. Stephenson, Department of Animal Industry, University of Arkansas, is credited with the idea of the pellet. A firmly compacted pellet, it was reasoned, would dissolve slowly in the pig's body.

Where should such a pellet be implanted? Behind the ear, suggested Stephenson. Here the circulation of body fluids is minor, and slow absorption would be obtained.

It worked! Stephenson tried pellet implantation of bacitracin on an experimental group of 207 pigs. Results are indicated in the table below.

SUMMARY OF WEANING WEIGHTS OF PIGS IMPLANTED WITH VARIOUS LEVELS OF BACITRACIN

Treatment	No. of Pigs	Mean 56-day weight (lbs.)	% increase in weight over controls
None (Control group)	59	26.08	...
1,000 units bacitracin	56	29.02	11.3
2,000 units bacitracin	44	27.18	4.2
4,000 units bacitracin	48	27.40	5.1

A three pound increase doesn't seem to be a great amount. Yet, this 11 per cent increase is substantially equal to the average response obtained by including antibiotic in properly formulated feeds and practicing good management.

Work at Iowa State college indicates that one more pound of weight at weaning means at least two more pounds at a given market age. *Even if no more of the antibiotic implanted pigs were weaned, this would mean about 19 pounds more litter weaning weight.*

You can easily determine what this would mean in dollars and cents at market weights. And this added income comes at no appreciable increase in production costs.

The new pellets were named Bacigro pellets, taking their name from the antibiotic used, bacitracin. Each tiny pellet contains 1,000 units of bacitracin. They are packed in boxes of 24, each individually wrapped in foil.

Here are some of the advantages of Bacigro pellets containing the antibiotic, bacitracin.

1. No change in the regular management system of raising hogs on the average farm is required to use and gain the advantage of such antibiotic pellets.

2. No elaborate equipment or extra labor is required. The pigs are pelleted at farrowing time.

3. Inexpensive. Only one pellet is required.

4. Easy to do. Any farmer can implant a pellet.

5. No management problems are involved. Pigs get the benefit from their natural milk food and the warmth of the sow. Actually the natural sow's milk is being supplemented to make a complete pig starter.

6. Immediate and sustained growth response is achieved. Pigs are heavier by an average 11 per cent at weaning.

7. The complete benefits of antibiotics are made available to suckling pigs at the earliest possible age.

The pellet is implanted just under the skin behind the ear of a pig at about two days of age. A special implantation tool, called a Bacinator, has been developed to administrator Bacigro pellets to baby pigs. No special skill is required to use this simple and inexpensive implanter designed for this purpose.

The site of injection should be rubbed lightly with a small wad of cotton moistened with 70 per cent alcohol (rubbing alcohol will do) and wiped with dry cotton.

Load the implanter and keep the tip pointed upward to prevent loss of the pellet. Grasp the loose skin behind the ear between the thumb and forefinger of the left hand. Force the sharp point of the implanter through the skin

about one and one-half inches from the base of the ear. Keep the point just under and parallel with the skin and advance it about one inch beyond the skin opening. Push the Bacigro pellet through the needle with the plunger. Slight pressure with the thumb and forefinger will hold the pellet in position while the implanter is withdrawn and until the tissues are returned to their normal position.

Here are some points that are important:

1. The use of Bacigro pellets containing the antibiotic bacitracin is not intended to replace antibiotic pig starter feeds. They merely supply a needed antibiotic at a time when the baby pig does not have another source.

2. Baby pigs should be encouraged to eat pig starter containing an antibiotic as soon as possible.

3. Continue to stress good management and feeding practices with your hog raisers.

4. Antibiotics are not a cure-all. Use them for their intended purpose, not to cover up poor management.

If your dealer or druggist cannot supply Bacigro, Farmer's Digest can place your order with a mail order supplier. Send $3.45 plus 10c postage for 24 Bacigro pellets. Send $1.75 plus 10c postage for a Bacinator. Address Farmer's Digest, Box 404, Fort Atkinson, Wis.

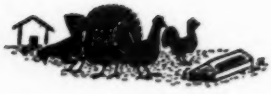
Hogs, Feeder Cattle vs. Dairy Cattle

Feeder cattle and hogs are good enterprises for the farmer with plenty of feed but a shortage of labor, but dairy cattle are good bets for the operator with limited feed supplies and ample labor, according to Minnesota agricultural economists.

After analyzing records kept by 32 southern Minnesota farmers in 1951, S. A. Engene and Niels Rorholm point out that feeder cattle and hogs returned more per hour of labor than did dairy cattle and poultry. Feeder cattle gave the highest return per hour of labor, with a return of $2.68. Hogs were second with a return of $2 per hour. Dairy cattle were third, with $1.51, and chickens fourth with $1.21. The economists emphasize that these figures are not net returns, but are what remains for the farmer not only for labor but also for management, insurance, taxes and other overhead costs.

Most farmers can market more of their labor with dairy cattle than with feeder cattle. In 1951, for example, a farmer feeding $8.05 worth of feed to feeder cattle would use one hour of labor, with a return of $2.68. If he had fed the same amount of feed to dairy cattle, he would have used 5.2 hours of labor, with a total return of $7.85. *University of Minnesota*

Gozzis' Turkeys Sell at Retail



Condensed From
The Turkey World

Prof. G. T. Klein

THIS is the story of a boy, the son of a coal miner, born in Italy, who came to America at the age of 4, went through our schools, worked as a contractor, married, and became one of New England's up and coming turkey growers and breeders.

At Guilford, Connecticut, on the old Boston Post Road, better known today as route 1, you'll find Gozzi's Turkey Farm. It's just 12 miles from New Haven and 85 miles from New York City. Here, on a 12 acre piece of land and a few rented acres, is a breeding flock of 900 Broad Breasted Bronze and 500 White Hollands. Market birds, including the breeders which were sold after the hatching season, totaled about 10,000 last year.

Gozzi's farm is in a preferred spot for retailing. It's not only within driving distance of 10 million or more consumers, but it is also in the midst of a fine summer resort. This gives a particularly good summer market for hundreds of birds, particularly in the smaller sizes.

About 70 per cent of the Gozzi birds are sold at retail. The other 30 per cent, largely the heaviest toms, go to restaurants, hotels and stores. Some of the local stores work with the farm by handling birds carrying the Gozzi Farm tag.

It's Mrs. Gozzi who does the retailing. She has the job of convincing customers that a well wrapped, fresh frozen bird is safer for them to buy than an unfrozen New York dressed bird. She also has the job of convincing customers that it is no more expensive to buy a bird based on the eviscerated weight than on the New York dressed weight.

A backyard flock of 100 birds got the Gozzis interested in turkeys. He was working as a contractor at the time. This flock paid 40c an hour for the time of caring for it, plus a profit of about $60. It looked favorable enough to prompt moving to a rented farm where 1,000 to 1,500 birds were raised for a few years.

In 1945, Gozzi decided to give up contracting and either sink or swim with the income from turkeys. There were scarcely more

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Mount Morris, Illinois

than 1,200 the first year on the new farm. However, it was a good year, and the income kept the wolf away from the door. Then came the job of building brooder houses, sun porches, a salesroom, a dressing room, a walk-in freezer, and the other necessities that go with a turkey farm.

The retail business was built slowly. Small ads were placed in the Guilford and New Haven papers. Satisfied customers passed a good word along to friends. Then there was the roadside sign, the turkeys on the hillside in plain view of one of the nation's heaviest traveled highways, write-ups by the local newspapers. One of the most effective promotional activities was a few birds neatly displayed at a local fair. Hundreds of people saw the display. It resulted in many sales.

The buildings have sort of grown with the business. Brooder houses on the farm were doubled in size by widening. New ones were built as more space had to be provided. Gozzi does not like the small buildings heated with gas and coal, but is making them do for a time, true New England style.

All poults get a 10 day start in battery brooders which are located in the dressing room. They are fed on crumbled feed to eight weeks of age, and then on pellets for the rest of the stretch. The birds are on two well known commercial feeds. In each case, the instructions of the manufacturer are followed explicitly.

All poults are debeaked at six to eight weeks, but not too far back. Those that are to be raised on porches get bits at 10 weeks. The birds that go to the range do not.

The birds are finished well enough for slaughter at 24 weeks, due to the pellet feeding program. Cool weather is no longer a requirement for getting a marketable bird.

Gozzi prefers range management, although porches are used all the way for some birds. All of the toms go to range, and many of the Broad Breasted Bronze hens do, too. The White Holland hens, however, are lighter and take a delight in flying out of the field. They are raised on the porches.

Under construction and remodeling is a large porch which will house breeders. Old metal sheets have been placed over the slats for a solid floor. Litter will be put down over this solid floor. Breeders will get eight square feet of total floor area.

Under the porch is a sand floor which will also serve as a breeder pen. Sides are boarded up three feet, with wire above. Gozzi hopes this will be enough winter protection.

It was his winning at the

dressed and live bird shows that got the Gozzis interested in selling poults. A handsome assortment of cups from New England's leading shows brought many inquiries for poults. The number of breeders was increased up to the present, 1,400. All are Pullorum-Clean on tests made by the state of Connecticut.

The White Hollands are the off-season birds. Their smaller size and attractive dressed appearance at any weight makes them better suited for the summer and early fall business than the Broad Breasted Bronze. In 1951, 1,000 White Holland toms were dressed at 10 to 12 weeks, weighing six to eight pounds. These were sold as broilers. This phase of the business will be expanded.

Gozzi's farm is in a thickly settled area where odors from the porches or an excessive number of flies could cause some lifted eyebrows. Lime and DDT are used liberally around the plant and especially under the porches. Special care is taken that water from the porches does not keep the droppings wet.

Bill Gozzi is vice-president of the Connecticut Turkey Growers' Association and an acting turkey director of the Northeastern Poultry Producers Council. Both Mr. and Mrs. Gozzi are active in the Boston Poultry Show and other Northeastern turkey events. Their 13 year old son, William, Jr., is a 4-H'er and has a turkey project. He plans to join the business.

Gozzi's prices to retail customers run a little higher than stores charge. Breaks on prices are made, based on the following weight classes under 20 pounds, 20 to 25 pounds, and up.

Mrs. Gozzi is a super saleslady. Her pleasing personality and friendly way of meeting the public brings customers back time and again. While they intend to make all improvements possible in the marketing of their retail birds, their goal is really set for a big poult business in the future.

SWEET CLOVER CAN BE DANGEROUS — Nebraska agronomists say bleeding of cattle is more likely to occur when improperly cured or moldy sweet clover is fed. Animal's blood is thinned by substance in hay. So far as is known, no bleeding has occurred with the feeding of sweet clover silage. Feed sweet clover hay with other roughage, they advise.

Georgia Farm Girl Reports on —

A Summer on Danish Farms

Condensed From The Nation's Agriculture

Rhonwyn Lowry

Through the International Farm Youth Exchange hundreds of boys and girls of many nationalities are gaining real understanding of how the people of other countries live.

The author of this article, a farm girl from Moultrie, Georgia, is typical of the American farm youth who are gaining broad experience through participation in the program. Miss Lowry returned from Europe last fall. In addition to giving United States young people experience in other lands, the International Farm Youth Exchange is enabling foreign youth to see American agriculture at first hand. The AFBF has placed most of these young people on American farms, and has given its hearty support and co-operation to the program, which is sponsored by the United States Department of Agriculture with Land Grant colleges co-operating.

UPON my arrival in Denmark as an International Farm Youth Exchange delegate I had very little idea as to what to expect of Danish Agriculture and even less of what to expect of the Danes themselves. I knew that it was a dairy country and I had heard of Danish bacon, but that was about my limit.

One of the first things that struck me about Denmark was the beauty of the countryside. Every inch of land possible was in

Reprinted by permission from The Nation's Agriculture, Chicago, Illinois

cultivation, and the fields were very well kept. I began to realize how necessary it is for the Danes to produce as much as possible on a little land, because it is such a small country with many people. Seventy-five per cent of the land area of Denmark is in cultivation, but only eight per cent of this is in forest land. Denmark is very short of trees as a natural resource and most of the forest must be planted by hand.

As a rule there are cows, pigs, fruit trees and different types of grains grown on one farm, but I think the main objective of Danish agriculture is to produce milk for butter and cheese, bacon and pork, and eggs. The other types of farming are usually incidental.

Kinds of Farms

Sixty-five per cent of Danish exports are agricultural. I expected to be eating a lot of Danish bacon, but I was told that it could only be had in England. They also export a lot of butter, cheese and eggs to England.

All three of the farms I lived on were a little larger than the average Danish farm which is 38 acres. On all three of my farms there was general farming, and on my last farm there were several hundred apple trees.

Another type of farm is the small holder's or "Husmaend." The government buys large estates and divides them into small farms on the average of 12½ acres. The house is built under government supervision but as the farmer would like to have it. He pays for the house, buildings and stock, but he rents the land from the government. He usually owns a few pigs and cows and through co-operative tractor stations he is able to hire a tractor.

At the other extreme are the estates of over 300 acres. There are very few of these and only 6.5 per cent of Danish agricultural land is in estates. These are becoming fewer and fewer because the government is gradually taking them over.

Co-operatives

One of the most interesting things about Danish agriculture is the co-operative movement. I had the opportunity of visiting several co-operative dairies, slaughter houses, seed companies, cheese factories, laundries and banks. There are 1,330 co-operative dairies in Denmark receiving 90 per cent of the milk which Danish farmers deliver for the production of butter, cheese and the sale of liquid milk. Most pigs are killed at co-operative bacon factories. The co-operative movement also covers the export of products, and the purchase of seed, oil cakes, and feeding stuffs. All three of my Danish hosts seemed to very well satisfied with the co-operatives.

I was surprised to find a high degree of mechanization on Dan-

ish farms. All three of my hosts owned tractors, and one farmer had just installed a new hay lift. Before the war Denmark had fewer than 4,000 tractors; in August, 1950, there were about 15,000. But there are only 14,000 holdings big enough to make the purchase of a tractor worth while. The Danes are very thankful to us for making some of this machinery available, and they are certainly willing to do all they can to get back on their feet again.

Homemaking

I also found the Danish kitchens more modern than I expected. Although they are all too large and call for unnecessary steps, there is much modern equipment. On every farm I visited I found electricity and running water. I also found many telephones. On the last farm I stayed I found a deep freeze. I did not find very much food preservation except of fruits and berries. I did find that the Danes are beginning to take advantage of community freezer lockers, however.

Most food for home consumption is grown on the farm. In every instance I found a garden with fruits and vegetables. The Danish farmer can have some type of fruit almost all year round if he is able to store apples in the cellar for the winter. In most cases the Danish housewife does most of her baking, except for the famous Danish rye bread. (The recipe is a professional secret.) I was surprised to find that rather than going to town to do her marketing the Danish housewife has the market come to her own back door. A man comes around one day and takes an order, and the groceries are delivered the next day.

Danish Cooking

I had to learn to cook all over again in a Danish kitchen because it was very different from our own. One of the first things I learned was that butter must be spread on the bread until you could no longer see the top of the bread — and then it should be spread on an inch thicker. The bread is always eaten cold. Potatoes are served twice a day with much sauce. Vegetables are usually served with a white sauce. I found everything from buttermilk soup to apple soup. On the farms coffee and cakes are served every afternoon. If you are ever invited to a "coffee" in Denmark you had better go prepared to eat. At least seven cakes plus bread and butter will be served. Something is always served before going to bed at night.

Youth Training

Another thing that surprised me was to find at least one or two house maids in most homes. This is very good experience for a young girl because it gives her

a broader view of housekeeping in a home other than her own. On my last farm the girls kept an accurate account of everything bought, and at the end of every month they had to figure the cost of the food. The Danish housewife spends much of her time in cleaning. The kitchen is scrubbed at least once a day. But in spite of this she always has time for her nap after lunch.

Practical Experience

When a boy is about 16 he leaves his father's farm and goes to another farm to learn new methods of farming. He usually spends the next three or four years on several different farms. In this way he learns different ways of farming and is able to decide for himself what is good and what is bad. Before a boy or girl can enter an agricultural or homemaking school they must have at least one year of practical experience.

The Danes are certainly a progressive people agriculturally, and they are always looking for better ways of doing things. They want to get the most out of what they have, and are willing to work.

New Treatment for Sinusitis

Two "wonder drugs" combined into pills that you "shoot" into the sick bird are the newest treatment out for turkey sinusitis.

The drugs are our old friends penicillin and streptomycin. When given together, they have a stepped-up effect which the chemists call synergism (sin-er-jism). It's like adding two and two and getting five.

You "shoot" the pills into loose skin at the top of the bird's neck, using the same tool used for "chemically caponizing" birds with hormones.

The recommended dose is one to four pills per bird, depending on the weight of the bird. This will make the treatment cost about 3 to 12 cents.

In Utah tests losses ran as low as three birds per 1,000 when treated with pellets, and as high as eight birds per hundred with other treatments.

Just as important, money-wise, the finished birds graded high. Four-fifths of the pellet-treated turkeys made grade A. Only one-fifth of the untreated flock went into grade A.

The new product is called "Strepel," and is made by Wyeth, Inc., Philadelphia. Drugstores will sell it. *Farm Journal*

Banded Fertilizer for Legumes

Don't Let Grass and Clover Seedlings "eat at the second table" During Critical Early Months

Condensed From Pennsylvania Farmer

J. B. R. Dickey

Pennsylvania State College

BECAUSE we believe it marks the most important step in getting good and vigorous legume seeding, we have been hammering on the "band method" of sowing alfalfa and clovers. This method was worked out by the Ohio Experiment Station. Many farmers have adopted it and report good results. For years we have put corn and small grain seeds close to the fertilizer applied with the drill or planter. There is no reason why the grass and clover seedling should not get an equal kick from similar placement. They are our most important crops and should not have to "eat at the second table" in their critical early months so far as fertilizer is concerned.

One of the difficulties of August seedings for hay and pasture, is that the little plants do not get big enough, or well enough rooted, to survive the first winter. Weeds, especially those which grow well in cool weather such as chickweed, share broadcast applications of fertilizer with the seedlings. Because the weeds are more vigorous growers they often smother the legumes. By using the band method of seeding we can give the seeds a very material stimulation. This makes the most of the limited number of weeks of growing weather in the fall. We can also give them the best chance at plenty of plant food, instead of allowing the weeds to derive equal benefit from it.

Ohio Experimental Results

On one experimental plot seven pounds of alfalfa seed and two pounds of timothy were sown August 18th. Five hundred pounds of 0-20-10 fertilizer were applied with the grain drill directly below the seed. The same amount of seed was broadcast with no fertilizer. The latter treatment is reported to have given a good stand, but the plants went into winter so small and weak that few of them survived.

On another plot, the fertilizer was drilled and the seed broad-

Reprinted by permission from the Pennsylvania Farmer, Pittsburgh, Pennsylvania

cast. The only vigorous alfalfa plants were those where the seed happened to fall and germinate directly over the fertilizer. Those which came up in between the drill rows performed just the same as where no fertilizer was applied, and failed to survive the winter. To get enough plants on the row to make a stand would have necessitated a heavy seeding. With a fine, solid seedbed and fairly satisfactory moisture conditions, seven pounds of alfalfa were reported to give a perfectly adequate stand. In fact, too many plants in the row from heavier seedings resulted in such serious competition among themselves that none of them grew as well as where the stand was thinner. All but the most vigorous were crowded out.

On another of the Ohio plots both the seed and the fertilizer were broadcast. The timothy and weeds seemed to do pretty well with this treatment. However, the fertilizer was apparently too much dispersed and diluted to give the alfalfa anything like the vigor it showed when the plant food was concentrated directly, about one and one-half inches, below the seed. Where the seed was run down the same spout as the fertilizer, and both were drilled as shallow as possible, the majority of the seedlings were killed by contact with the fertilizer (probably due to the potash salts rather than the phosphate) but those which survived did well.

Grass With Alfalfa

Two pounds of August, or fall-sown, timothy per acre gave a nice mixture of grass in the Ohio experiments. With spring sowing more timothy seed would be necessary. Some grass seems always desirable with alfalfa, unless perhaps it is to be dehydrated or sold. The grass takes the place of the weeds and helps keep out chickweed where the stand is thin. It increases the yield and helps to hold up and to cure the first cutting which we often have trouble with. The cows like a mixture better than pure alfalfa. If cut when the alfalfa is ready the grass makes almost as good feed. The fibrous grass roots result in better soil condition when the field is plowed with less erosion and generally better yields.

Brome is a nice grass and palatable, but the seed is hard to sow, slow to establish itself and there have been many failures to secure stands. Eight or 10 pounds per acre is generally recommended. Orchard grass, not much over three pounds per acre, is pretty sure to catch and is good where the first crop can be harvested early as for grass silage, before the grass becomes tough. Also where the second growth of orchard grass may be wanted for pasture. Old reliable timothy, however, is pretty hard to beat.

If one is sowing a fluffy seed such as brome, which requires a separate operation, it may be broadcast before drilling the fertilizer and legume seed, although this might cover the grass seed too deeply. Cultipacking or rolling after sowing with the band method might also cover the legume seeds too deeply. This would also obliterate the little ridges left by the drill which are some winter protection to the little seedlings. It is best to do the cultipacking and rolling before drilling, in order to get a firm seedbed with moisture not far below the surface. A rain soon after drilling will give just about the right covering with band seeding.

Drill Arrangement

The most satisfactory method of equipping the drill for band seeding is to have the pieces of garden hose held firmly about nine inches directly behind the boot. Thus the legume and grass seed falls exactly over the fertilizer, but far enough back so that most of the soil will have already fallen in over the fertilizer. Strap iron, used by plumbers to hang pipes from the ceiling, has holes already bored and can be fastened where we want it with stove bolts. The upper end of the hose can be pushed onto the spouts on the grass seed box, instead of the flexible metal tubes, and fastened by pushing a small finishing nail through it and the holes in the spout. Sometimes the metal spouts can be shoved firmly into the hose. The lower end of the hose is cut off on a slant so that one can more readily see if seed is flowing out of each spout. The hose should hang fairly straight when the boots are lowered so that the seed will flow readily. It would simplify matters considerably if the grass seed box could be moved to the back of the drill, instead of where custom puts it on the front. The Cockshutt drill, made at Brantford, Ontario, has the grass box behind and down close to the ground.

Band seeding has also worked to excellent advantage when sowing legumes with spring grain. It is possible that some who complain that they cannot get good stands with heavy crops of winter grain might succeed better by sowing with a light seeding of oats. Putting the small seeds directly over the fertilizer helps the legume or grass to develop a good root system early, so as to better survive dry weather and compete with the grain and the weeds.

We know that phosphate should be put pretty well down into the soil since it does not wash down readily. Also that the less phosphate is mixed with the soil the longer it will stay in an easily soluble form. Liberal amounts of phosphate at seeding may supply the legume adequately for several years. Potash is a different propo-

sition. Hay crops use nearly four times as much potash as phosphate but we cannot safely apply enough potash to last long without having a lot of it wasted and leached out. Since potash moves down pretty readily in the soil, annual top dressings of straight potash, manure or high potash goods, such as 0-10-20 or 0-15-30, may be the best way to keep a legume stand such as alfalfa or Ladino well supplied and vigorous. Too much potash salts in the band might also be too caustic for the little roots unless moisture was abundant. On less fertile soils three or four per cent of nitrogen in the band application in August might give the legume a better start.

New Red Clover

Pennscott, a medium red clover developed by the Pennsylvania Experiment Station, outdid other varieties as a hay crop in seven northeastern states. It was tops both when grown alone and when grown with timothy. Kenland and Dollard were the nearest competitors.

The new clover looks good for other areas, too. In Indiana tests last year Pennscott and Kenland tied with a top yield of 3.6 tons per acre. In three year tests in Utah, it out-yielded 29 varieties.

Pennscott seed is being increased as rapidly as possible, and there should be a good supply for forage planting in a year or two.

Farm Journal

Better Days Ahead for the Poultryman

If you raised a normal number of pullets this year you should soon begin to receive a profit on their investment. This encouraging word comes from Prof. E. D. Parnell, Texas A. & M. college.

Outlook for egg prices wasn't good last spring, says Parnell, and producers reduced their flocks and also their pullet replacements by seven per cent. Now the picture has changed. Storage stocks are being reduced and prices have strengthened. The future looks good. It is true feed prices remain high, but feed-egg ratios have become favorable for the first time in several months. Therefore, egg producers should be operating on the profit side for the remainder of the year.

Breeding and Feeding for Wool Production

Condensed From The Sheep Breeder

J. F. Walker

PROBABLY the first efforts toward improving the fleece of sheep were directed at producing softer wool and getting rid of the coarse outer hair. Color would not be of much concern so long as skins were worn and not washed. Just what plan was followed or how long it took to breed off this outer coat of hair is not known.

Breeding for color followed the art of making cloth. Cloth making developed new uses for wool and also called for better wools than did skin wearing. Jacob was the first breeder of whom we have any record who attempted to control the color factor.

It is evident that some laws of breeding were well understood and made use of in Biblical times. Considering the magnitude of the task, breeders of those early times seem to have been better versed in genetics than many modern ones. It is known that from Jacob's time, when the prevailing color was brown, it was less than 300 years until "as white as wool" was an expression frequently used. This early breed improvement took place in Palestine and Persia. From there it extended south through Syria into Egypt and the South Mediterranean countries. It went northward and westward through Turkey into Greece and Rome and finally to Spain, where its history merges into modern times.

The Romans, however, seem to have been the great caretakers and breeders of the time. The Greeks first adapted the method of sewing skins on the sheep to make the wool softer and to keep it cleaner, but the Romans frequently anointed the sheep with oil and fats, keeping them blanketed, and housing them at nights from inclement weather. The same practices are still to be found with some breeds of sheep prepared for exhibition.

Selection and in-breeding were likely the means adapted to develop better wool. The close attention which the Romans paid to each sheep would enable him to select those animals approaching the desired type, and the red

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sheep of Aartenia, a province of Rome, became known as the finest of all in wool production. This red cast appears to have been noticeable at birth, gradually disappearing except for the color of the ears and legs. Many of our best fleeced Merinos in the United States still show that characteristic.

If the development of the various breeds of sheep could be accurately traced, much useful knowledge on wool production might be obtained. Was a common ancestor responsible for the fine fleeced Merino and the long wool Lincoln? If so, and all indications point to such a situation, was breeding, feeding or climate in part, or wholly, responsible for the wide variations in length, quantity and quality of fleece?

It is known that climatic conditions have a great influence on the character of the fleece. Fine wool sheep have been introduced into the Aleutian Islands with little success. The moist climate and rank growth of vegetation was considered responsible. Ohio Delaines transferred to the Upper Peninsula of Michigan have had the same experience. Other breeds appear to succeed under such conditions.

Environment has doubtless weeded out the unfit, and after a certain time left only the type best fitted to survive. Type of wool would play a very important part in this process of natural selection. A fleece that would not afford proper protection would disappear under this rigorous law. Here then is the basic law for successful wool production. Select breeds suited to the conditions under which they must live. This can best be determined by studying the conditions where the breeds have attained their greatest perfection. The oft repeated advice of "Breed the kind you like the best," is misleading and often disastrous. The only safe plan to follow is to breed the sheep adapted to your climate and system of management and that most nearly answer the market demand for wool and mutton.

Both breeding and feeding enter into wool production. Certainly wool of the best quality cannot be produced without proper breeding. Neither can the best bred sheep produce a good fleece without proper feed and environment.

When wool production is discussed it is natural to think of the Merino breeds of sheep. However, some mutton breeds approach the Merino both in weight of fleece and value on the market. Wool production is being given considerable attention by the best breeders of mutton sheep and the principles are the same regardless of breed.

The theory that fleece influ-

ence and external appearances are largely dominated by the sire is generally accepted. Through the selection of the ram, improvement can be most rapidly brought about. Such characters as density, yield of clean wool, length and quality of staple are obtained by breeding; feed modifies them but feed will not transmit them to the next generation. A careful study of the fleece characteristics of the ram and also of his ancestors is the only safe plan to follow. The first consideration should be evenness of fleece over the entire body. Wool is fed by means of the circulation of the blood. The better the skin circulation the more even the fleece and the more valuable in consequence.

The ram's fleece should not only be uniform but it should be masculine in character. Many breeders consider masculinity and coarseness as synonymous terms and any fleece that is fine in quality is called effeminate. This is a mistaken conception. A masculine fleece can be very fine in quality provided it has a firmness under the hand, a resiliency to the touch and body to it. The Australians call it "bone." An effeminate fleece is soft and mushy, lacking in body and firmness and generally carries an indefinite crimp. Such a fleece on a ram, or ewe, indicates poor breeding capacity for either wool or mutton.

Density is important but frequently confused with grease. The unskilled buyer sometimes looks at the surface to judge density. It is a common practice to load the surface fleeces on exhibition, fine wool sheep with paint and oil, and mutton breeds with various earth compounds in the form of pastes. Blanketing also helps to compact the surface of the fleece. The practice even goes so far as to load the interior of the fleeces with oils of various kinds, the variety depending on the breed and the individual preference of the show man. Some exhibitors do not practice such means of producing a false density but the buyer of exhibition stock must rely on the reputation and integrity of the breeder in this regard. A fleece heavily loaded with grease, natural or artificial feels dense when parted or when grasped between the thumb and fingers, another test for density. Such a fleece, however, when pressed closely lacks the resiliency and spring and feels dead and soggy to the touch. The test, however, is deceptive.

At a test carried on at Wooster, Ohio, conducted jointly by the Ohio Experiment Station and the U. S. Department of Agriculture on some factors affecting growth and quality of fine wool, a ram judged 95 per cent perfect for density carried 15,039 fibers to the square inch. This ram's fleece

yielded 33.2 per cent clean wool. A Tasmanian ram whose density percentage is not given carried 44,495 fibers per square inch, an unusual difference, giving the latter a perfect score for density.

In a further comparison between 10 American and Tasmanian Merino ewes, the former were judged 84.9 per cent perfect for density as against 84 per cent perfect for the latter.

Taking the two flocks and their offspring over a period of six years the Tasmanian sheep showed an average of around 10,000 more fibers to the square inch than did the American, or about one-third. The yield of clean wool, however, showed that the average yield of the American Merino fleeces was approximately 36 per cent while those of the Tasmanian yielded slightly over 52 per cent clean wool. A clear instance of where expert judgment was deceived by grease.

Density is generally associated with wrinkles in the skin. Here again these same experiments developed the fact that in a group of 27 ewes 16 of which carried smooth bodies and slightly folded necks and 11 defined as moderately to definitely wrinkled, the smooth group carried an average of 27,487 fibers to the square inch, while the wrinkly group averaged some 23,898.

As any animal's capacity for production is limited it is safe to assume that an animal producing an excessive amount of grease must do so at the expense of wool production and that such fleeces will really lack in density regardless of feel. Density is essential in preserving the sheep and fleece from the weather but kind of tip on the fleece is also a vital point. A stringy open tip permits maximum weathering. The tip should be compact and square offering the greatest resistence to dirt and rain.

Length of staple is important. The high priced wools are the staple or combing wools. Such wools run from two and a half inches in length upward. They generally command a premium of around 5c per pound on the market and have the widest outlet. A sheep failing to produce staple wool, except on account of advanced age, should not be kept in the breeding flock. The Southdown might be considered an exception to the rule but considerable could be done in improving Southdown length and weight of wool without hurting the carcass and adding considerable to the value of the sheep.

It is frequently heard that length and density are not associated together. Let us turn again to the Wooster tests, remembering that the Tasmanian ewes showed some 10,000 more fibers to the square inch than did the American. Yet the average length of

the fleeces from the Tasmanian sheep over a period of years was 3.17 inches as compared with 2.74 inches for the American sheep. All the Tasmanians graded staple wool, while some of the Americans failed to do so. The test further showed that length is not a variable factor in the same sheep except under adverse conditions.

Character refers to brightness and crimp. The fleece should be bright and carry a well defined half circle crimp. The crimp should be uniform throughout the length of the fiber and not show frowzy at the tip.

Brightness is dependent largely on the quality and quantity of oil or grease. A light, clear, free flowing oil, whose presence is hardly perceptible to the eye is the ideal type. It is rarely found in American Merino flocks but is the rule in Australian, Tasmanian and New Zealand sheep. That this type of oil is not the result of climatic influence is proven by producing it in the United States through several generations from a Tasmanian foundation.

In mutton breeds the color of the oil is generally a straw color rather than white. It seems to adequately protect the fleece and is rarely found in excessive amounts.

The "quality," and this term refers to the fineness of fiber, will vary according to breed. A ram's fleece should be fairly representative of the normal grade to be found in any one breed but a slightly stronger fleece in the ram than in the ewe is held by many successful breeders as necessary to preserve weight of fleece and in mutton breeds constitution.

Quality and quantity of wool varies greatly within the breeds. This is the result of breeder's inclination and skill, or lack of it, in breeding. It is unfortunate that many breeders know but little of wool qualities or of consumptive demand.

On the other hand one sees a continuously expanding use for wool in newly developed fields.

Over a long time period it would appear that medium wools will have the greatest average demand, with an outlet for fine staple wools to the finer dress goods trade where they must meet the competition of silk, cotton and rayon fabrics. Long wools will have the competition of mohair to meet and their value will largely depend on the demand for wool plushes and similar fabrics.

The ewe flock should be watched each year in regard to wool production. If the flock is large enough to require the services of more than one ram it should be divided so as to overcome existing defects. All short fleeced ewes, unless extra mutton producers, should be culled.

Irrigate Pastures

For More Feed in Dry Weather

Condensed From Ohio Farmer

Virgil Overholt

WHEN dry weather hits, the milk check gets smaller. Bert Leas, Ohio Jersey breeder, avoids the dry weather slump by irrigating his river bottom pastures. Milk production has held at an even keel during the past two summers under the system. Irrigation is a form of insurance against dry weather. You may want to study the terms of the policy between now and next summer. It may or may not fit your farm.

Research work in Georgia shows that twice as many steers can be carried on irrigated pasture as on unirrigated pasture. Oregon experiments show that fertilized and irrigated Ladino clover-grass mixtures can carry two cows per acre and furnish the bulk of their feed requirements.

Profitable pastures are not insured by irrigation alone. Irrigation will increase the benefits of other good practices such as liming, fertilization and pasture rotation. You can't wait until the pasture has suffered damage before irrigating.

Sometimes the equipment can be used for more than one crop. A farmer in Washington County, Ohio, irrigates early cabbage and tomatoes in the spring and irrigates his pasture later in the summer with the same portable equipment. This cuts down the overhead costs.

Lots of water: Under Ohio conditions, from one to two inches of water will be required per irrigation. That will be from 27,150 to 54,300 gallons per acre per application at periods of one to two weeks during times of no rainfall. Based on average Ohio rainfall, a total of from four to six inches will be required per season. Pasture irrigation will therefore be limited to those situations having an abundant supply of water near by. Streams are the most common source of water for irrigation. You will need to check to avoid injury to landowners located further down the stream. For large streams this will

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seldom be a limiting factor.

There are irrigation wells in Ohio yielding up to 800 gallons per minute, but the possibility of obtaining wells strong enough for irrigation is limited.

A farm pond covering one acre and having an average depth of four feet will be adequate for irrigating from 10 to 12 acres of pasture.

How to apply: In Ohio, best results will be obtained by use of lightweight portable pipe and rotary sprinkler heads. Aluminum pipe is popular with many farmers because of its light weight. Either steel or aluminum pipe can be quickly moved from place to place. It can be laid over uneven ground and around curves.

There is a wide variety of sprinkler heads on the market. Some will work with pressures as low as five pounds per square inch; others require 80 to 100 pounds. Some will deliver as little as two to four gallons per minute each; others as high as 300 to 400 gallons.

For pasture irrigation, high pressure, high capacity sprinkler heads will require less labor in moving. Due to the high pressure used they will require somewhat more power to apply a given quantity of water. Some of the giant sprinkler heads will irrigate two to three acres at one setting.

Rate of sprinkling: Regardless of the method used, the rate of application must be slow enough to prevent surface run-off. Surface run-off from good pastures will cause little or no erosion but will result in excessive application in the low spots and insufficient water on the high areas. Most sprinkler head combinations will require about two hours to put on an inch of water. This is not too fast for most pastures. Sod provides ideal conditions for the rapid intake of water.

Water should never be applied in sufficient quantity to produce seepage below the root zone. Water that either runs off the field or percolates below the root zone means loss of power, loss of water and waste of time.

Irrigated land in the humid areas should have reasonably good, but not excessive, internal drainage. If the soil has poor drainage and heavy rainfall follows closely after irrigation, damage may result from too much water in the soil. Where the internal drainage is excessive, too much of the water will percolate below the root zone.

It doesn't pay to try to irrigate without a well engineered plan. After building a makeshift system, one farmer found that it would require ten 40-hour weeks to apply one inch of water to 11 acres.

A well engineered irrigation system will have: (1) The right type of pump of the required

capacity. (2) A size of pipe from source of water to irrigation field that will not produce an unreasonable friction head. (3) Sprinkler heads of correct capacity and working pressure. (4) A suitable power plant.

It will pay to purchase your irrigation equipment from a company having engineers competent to plan and install a system to meet your needs.

New Promise for Artificial Breeding

It looks like one of the dreams of animal breeders has come true. Scientists have succeeded in storing bull semen for long periods for later use in artificial breeding of cattle. A new semen processing method has been developed by British scientists.

Now, instead of losing its fertility after storage for a few days, semen has been stored for as long as four months without losing fertility. This was proved by actually processing semen by the new method and using it to inseminate cows after it had been stored for various periods of time. Of 12 cows inseminated with semen stored for four months, 10 had not required rebreeding 15 weeks later.

The new procedure calls for freezing the semen to minus 79 degrees Centigrade—the temperature of dry ice. The British scientists used glycerol and an egg yolk mixture to protect the sperm cells from salts which concentrate around them when the semen is frozen.

Artificial breeding organizations all over the nation will be highly interested in this new procedure. If the process proves itself under practical conditions, it will be possible to use semen from one particular bull to breed cows according to a plan laid out months ahead of time. This isn't always possible when semen can be stored for only short periods of time. Frozen semen may make possible more efficient use of our outstanding herd sires. *University of Wisconsin*

Suckling Pigs Need Fresh Water, Too

Little pigs need plenty of milk to make a good start after they're born. They need fresh water, too, says Gordon Ashton of Iowa State college.

Sow's milk is about 80 per cent water, but he says that that's not enough for the pig to get full benefit from the dry matter and nutrients in the milk.

Ashton advises giving pigs fresh water when they're two or three days old. They'll usually drink a little at five or six days if pans or fountains are low enough for them to reach, and they've been known to drink at two days if they have scours or TGE (transmissible gastroenteritis). *Farm Journal*

Take Advantage of the Architecture of the Cow

Condensed From Holstein-Friesian World

Dr. R. E. Petersen

IF WE TAKE advantage of the architecture of a cow, realizing that it has a digestive tract which enables it to digest over 90 per cent of the cellulose in its feed, we can save money in feeding operations. It is built for the handling of rough feeds rather than large amounts of concentrates. It has an enormous advantage over any other species except sheep and goats.

As far as digestive juices are concerned, the cow is no different than the single stomach animals. But that enormous rumen or paunch has a large number of micro-organisms that act upon feed components and change them to materials digestible to the cow. These micro-organisms convert fiber into fatty acids.

The most important of these fatty acids is acetic, the acid in vinegar. About 70 per cent of the acids produced in the rumen are acetic acids. About 20 per cent are proprionic acid and 10 per cent butryic acid, the later found in butter. The cow has built up a physical dependence upon the acids produced in the rumen. It is possible that ketosis may be caused by inadequate production of fatty acids. The cure for this might be the feeding of one pound a day of sodium acetate (at a cost of about 11½ cents a pound).

If cows are fed on grain and concentrates alone, they will be unhappy animals. They must have at least a certain amount of roughage, and it is well to remember that good beef or good milk can be produced on legumes, grasses and hay alone. We have the habit of feeding concentrates to cattle to make up for the deficiencies in the rough feed. But, generally, our rough feeds are of such low quality that we do not feed enough concentrate to make up for the deficiency.

Though cattle can handle cellulose efficiently, they cannot di-

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Laconia, New York

gest lignin, the hard woody fiber in the stems of mature or over ripe hay and grasses. By its tendency to depress the digestibility of other constituents in the feed this hard to digest substance, lignin, does far more damage than the percentage of its content in the feed would indicate. Lignin analyses are expensive because they take so long. The most reliable test requires 30 chemical steps and three days. But we can remember that lignin develops as the plant matures, so mature grasses and legumes have a high lignin content. Grains are low in lignin, even oat and barley hulls.

Much economic wealth can come to American agriculture by giving attention to our roughage. We should revert back to the practice of keeping our production values in terms of pounds of beef or pounds of milk produced per acre of land.

Young grass — six to eight inches in height—is high in nutrient content and contains practically no lignin. New Zealanders have found this by trial and error. In that country it is sacrilegious to feed any concentrate to cattle or sheep, yet they produce high quality wool, lamb and beef.

Consider the record of a Friesian (Holstein) cow fed only on hay and grass. It gave 932 pounds of butterfat the first year, had 286 days of continuous twice a day milking. The second year it produced 938 pounds of butterfat. It was part of a herd which averaged 541 pounds of butterfat.

When we keep our farm records so that we can measure the production of pounds of meat, milk and other livestock products in terms of per acre of land, we will become smarter farm managers than we are today.

Quality products can be produced, too. The New Zealander eats more than twice as much meat as we do and it is very good meat. In London at the Smithfield Market, some years ago, I first saw Canterbury lambs. I was told they came from New Zealand and that it was the world's finest lamb. So when I was in that country, I made it a point to find out how it was done. It is all done by grass and hay.

Grazing is the most important factor in New Zealand cattle or sheep operations. In most areas they can graze for nine or 10 months and have only two or three months of dry feeding. They find that grasses have the highest value when six or eight inches in height.

Fertilizing will increase total yield. It will also increase the density of the stand so animals can get what they want with a minimum of effort, and it delays the time when lignin sets in. First, find out what fertilizer element or elements are needed to give maximum production.

A pasture must be seeded to varieties of grasses and legumes that will do the best for the soil type and climate conditions. New Zealand has the largest and best equipped grasslands experiment stations in the world. Our own country has a large potential for such work. We have plant breeders in nearly all experiment stations, and they have done excellent jobs in some lines. Hybrid corn, for example. And they could do an equally good job in the field of forage crops. In fact, the opportunities here are greater than anywhere else. Wherever we need to have a soil improvement program then we must have forage crops as a necessity in such a program.

We should feel ashamed of the dairy business selling veal calves. That is a crime. We ought to carry them on to heavier weights. If we have decent roughage we can carry them on roughage. But let's get them into meat production. You can have pretty good meat from dairy breeds. The Holstein will produce more pounds of beef per 100 pounds of feed than any other animal. We raised some on pasture last summer (pasture only) and it wasn't a bad record of production.

At Minnesota we have developed the technique of asking the cow what she thinks of hay. She has told us very bluntly that she has no respect for a hay grader's opinion. She will often pass up a hay which is U. S. No. 1 Leafy Green for some terrible looking black, much rained on hay. The latter was young, cut in the early bud stage, the first was mature, which meant lignin formation.

We repeated the test last year. With one batch of hay, U.S. No. 1 Leafy Green, they ate 49 pounds of corn silage per cow per day and took all of their grain they were supposed to have. With the other, same grade, they went down to 22 to 23 pounds of corn silage a day. And over half of the cows did not eat grain at milking. What was the difference in this hay? The hay they didn't like had beautiful purple flowers in fairly liberal amounts. That means maturity, lignin formation. The hay they liked had no flowers. It was cut early in the bud stage.

Last year we raised hay for experimental purposes. On the 25th of May we cut five acres of alfalfa in prebud stage. Then followed 14 days of precipitation. By that time the hay was devoid of any green color. It came out of the bale dark and gray.

We have just completed offering this to cows in comparison with some U. S. No. 1 (containing flowers). The cows ate every bit of the dark hay, much rained on, before they touched the No. 1 Leafy Green hay.

Rotation grazing has many ad-

vantages. It is flexible. It will work on any farm. Another thing to remember is that undergrazing is worse than overgrazing.

We have been conducting grazing tests, using identical twin cows. One was on continuous grass (alfalfa-Sudan), put on in May and not taken off until September. The other went on in May, same crop, same land. But every day this cow was limited to what it wanted on a certain area, then moved on. The difference in the milk produced by the two was quite significant.

Wider use and proper handling of forage crops is not only good for your cattle feeding program; it is necessary in a soil improvement program. Grass silage properly preserved has all the food values of the crop from which it came. If cut early, grass silage is superior to corn silage. It is higher in protein. At about five to six inches, the protein on dry material basis will be around 22, 23 or 24 per cent. Also, grass silage is lower in lignin and fiber content. Corn silage can be cut any time so long as the plant continues to grow, unless it is so young there is no yield.

Bossy a Crook? Nose-print Her

You know about taking fingerprints for identification. Here's a new one. You can now take "noseprints" of your dairy animals for the same purpose.

FBI experts teamed up with dairy specialists to work out the system. They found that every cow has a different "pattern" on her nose—just as every person's fingers are different.

Three researchers at South Dakota Experiment Station have put the finishing touches on a way to keep the prints straight.

They have a system for each sex of each breed, based on four basic noseprint patterns which fall into various types of ridges, dots, lines or combinations of the three marks. And they can separate the noseprints of any breed into 5,832 different groups, which makes identification simpler, they say.

How do you nose-print old Daisy? Press an ordinary ink pad on her nose, roll a 4x7 inch No. 2 blue bird blotter against it, and you should get a clear print.

Identification can be important in the case of purebreds or diseased animals. Other means sometimes fail—ear tags tear out, or records of an animal's color markings are either not kept or are lost.

The system is not in practical use yet, but may be one of these days—if you can get your cows to co-operate.

Farm Journal

Honey, There's Plenty of Honey

Condensed From Marketing Activities

ALL THE buzzing about honey this year will not be done by the bees. Since late last winter, groups interested in marketing honey have been busy with plans to make this year one of bumper consumption.

Spearheading the drive to get people to eat more honey is the Food Distribution Branch of the Production and Marketing Administration, USDA. Under the department's Plentiful Foods program, this agency has launched one of its special merchandising projects to push consumption of the product this year. An industry-wide sales program has been arranged by the beekeeping industry to tie-in with this "plentiful foods" promotion.

Through the dovetailing programs, the assistance of everyone, from the beekeepers who produce honey to the distributors, retailers, restaurants, bakers, confectioners and consumers who sell, serve and use it, is being enlisted to make this year one of record honey use. Peak of the honey merchandising drive is directed at the month of October, when new crop honey will be in liberal supply throughout the country.

Behind all this activity for this one particular farm commodity is a lot of history. Briefly, here is some of the background.

Honey, the oldest of the world's sweetenings, is produced in every county of the United States. But today, the economic importance of the honey bee to food production stems more from the pollination work of the insects than from the amount of honey and beeswax produced. Some 50 agricultural crops — seeds, fruits and some vegetables — are almost entirely dependent upon bees for pollination. In practically all farm areas, honey bees are so essential to this purpose that beekeeping must be carried on to maintain a profitable agriculture. In certain areas this pollination assistance is so necessary to the production of better seed and fruit that growers of these crops pay beekeepers for the use of their colonies.

Aware of this need to maintain the country's bee population at a high level to provide for adequate pollination of growing crops, and realizing that beekeepers' compensation derives primarily from the sale of honey, the U. S. Department of Agriculture

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for several years has undertaken a search for new market outlets for the product. These same considerations evidently played an important part in the action by the congress under the Agricultural Act of 1949, which makes price support for honey mandatory.

Price support operations during the past two years have been carried out through USDA purchase programs operated through honey packers. This year, price support will be carried out through loans and purchase agreements which have been made available to honey producers. Recent price history of the beekeeping industry shows that producers' returns have remained close to support levels, and honey, like some other crops, because it has consistently been in plentiful supply, is referred to as a "12 months surplus" commodity.

Some of this is attributable to the impetus given honey production in the United States during the World War II period, when sugar was in relatively short supply and honey prices were favorable, as well as to increased use of honeybees for pollination. With the end of the war and increased availability of sugar and other lower cost sweets, honey consumption began to decline. The year 1947 was one of particularly abundant honey production, about 27 per cent of the production being carried over into 1948. Stocks carried over into 1949 and 1950 were estimated even larger. Last year's honey production is estimated to have been 259 million pounds, about per cent above the previous year's crop.

Several times during the past years, honey also has been on the department's "plentiful foods" list as a seasonal item. This year, the beekeeping industry urged that it be given "all-out" treatment under the "plentiful food" program.

The "Plentiful Foods Program" of the department is based on the sensible premise that the widest possible use of foods in abundant supply directly benefits consumers, producers and the food trades. Each month those foods in abundant supply are placed on the plentiful foods list which is given broad publicity through the food trades, the press, radio and other information media.

To be eligible for the list, foods must be of the type that are generally consumed; and must be generally available throughout the country in larger supply than the market will readily absorb. It also must be demonstrated that there is danger of unnecessary waste, or prices will be unduly depressed, unless consumption of the foods is stimulated.

Usually one or more foods are listed as "feature items" for intensive promotion because they

are in extremely abundant supply.

If a particular food is in such abundant supply that it is felt that still further stimulation of consumption is necessary to stabilize markets, it is made the subject of a "special program." Then, FBD, in co-operation with and supplementing activities of producer organizations, enlists by letter and personal contact the support of all marketing groups interested in the food, state and local officials, chambers of commerce and others in a vigorous marketing program. In addition, other agencies of PMA and the department furnish background information, fact sheets, menus, recipes, and other materials for newspapers, radio, TV, magazines and advertisers, and give other assistance to the intensified program.

This is the type of program under way for honey this year.

Officials of the production and marketing administration are particularly interested in the honey project, because it is the first to be placed in operation for a "year around" plentiful crop and the first to be planned so far in advance of the marketing peak—which is October. With a successful honey program, a similar approach could be used on other foods in consistently heavy supply, such as dried fruits, peanut butter, and dried beans. In fact, a special merchandising program for dried beans, designed to culminate at the height of the expected period of heaviest abundance next January and February, is now being considered.

As part of the basic work on this year's honey merchandising program at the national level, meetings have been held by Food Distribution branch representatives with beekeepers in all 48 states; conferences have been held to discuss their parts of the program with organizations of honey distributors, wholesaler and retailer organizations, restaurant and other public feeding groups, advertisers and others.

Tie-in promotion is being arranged with millers who make biscuit, hot roll and waffle mixes; bakers making honey graham crackers, honey and milk bread; ice cream manufacturers; confectioners; and the citrus industry, which intends to promote the use of honey on grapefruit.

Several of the country's largest grocery chains plan to carry out wide scale advertising programs, and glass container manufacturers have promised their co-operation. The meat industry, which already has its advertising programmed ahead to this fall, intends to feature "little pig sausage" in October. What could be more natural than a hot cakes and honey tin-in with the sausage campaign?

The food trade groups—wholesalers and retailers — have the

next big job, say the representatives of the Food Distribution branch—that is, to "get honey off the back shelf." As one official in PMA puts it:

"Honey, despite all promotion work that can be done, is 70 per cent an impulse item. Few people put it on shopping lists. Most housewives must see it before they buy it. So we say to the retailer; 'Get your honey off the back shelves and out where your customers can see it.' "

Report on Weed Killers

Here's a report on the latest chemicals for controlling grassy weeds. New products are continually coming onto the market or are being proposed for control of weeds. Following are results of tests made at the University of Wisconsin.

Last year, materials tested for quackgrass control were CMU, TCA, dichloral urea, sodium chlorate and maleic hydrazide. Of these, CMU seems very promising, but TCA and sodium chlorate remain the recommended chemicals for quackgrass control.

CMU killed quackgrass with applications of 20 pounds per acre, a rather low rate of application. TCA, for instance, requires 80 to 100 pounds per acre. But this is the first year of testing with CMU. If next year's tests show that CMU remains toxic in the soil for very long periods, it cannot be recommended for quackgrass control on crop lands.

For the present, Wisconsin agronomist Ken Buchholtz is recommending that farmers use frequent late summer cultivations in dry years as the most economical control of quackgrass for field scale work. In wet years a spray of 20 pounds of TCA per acre followed by at least two cultivations is an alternative.

TCA remaining in the soil doesn't seem to be a problem in Wisconsin, Buchholtz says. Applications of 40 to 80 pounds per acre in late summer did not injure sensitive soybeans or corn planted in the fields the next spring.

Thirteen chemicals were tested against the annual weedy grasses and broadleaf weeds. TCA, CMU, endothal, maleic hydrazide and CIPC look promising for controlling the grasses. Of these, CMU and endothal were the most effective.

All the materials require further testing to determine their value against broadleaf weeds. For the annual grasses and broadleaf weeds, application rates are 2 to 16 pounds per acre—much less than for quackgrass. The responses of crop plants to these weed killers are still being studied.

A Valley Is Reclaimed

Condensed From The Rural New Yorker

Thomas Powell

THE reclamation of a worn out farm, thanks to modern conservation, is no longer so rare an event as to be particularly earth shaking. But when a whole river valley of some 330 square miles is transformed from an eroded and pollution ridden area into a beautiful, healthful and prosperous section, that is news!

In March, 1945, some farmers, sportsmen and townspeople, all living in the Brandywine Valley of Delaware and southeastern Pennsylvania, got together to take a good look at their river and their land. Out of that meeting grew a conservation program that stands as one of the finest examples of land reclamation and watershed protection in the country. Best of all, the highly successful program of the Brandywine Valley Association is one that can be copied in every section and there are many where there is such need.

Brandywine Creek starts up in the hills of Chester County, Pennsylvania. From thence it meanders gently through some 60 miles of green rolling country down to meet the Delaware River at Wilmington.

A hundred years ago, the creek and its tributaries were crystal clear and abounded with largemouth bass, brook trout and white shad in season. Wild turkeys provided many a luscious dinner, and thousands of birds kept the woods and fields ringing with their songs.

And the farms! The Quakers who settled the upper valley were among the world's best farmers. Their land was fertile and well watered. It spawned lovely whitewashed stone farmhouses, herds of fat cattle, wheat and corn in prodigious amounts, and fruit trees sagging with their weight of apples and peaches. Until perhaps the turn of the century, these farms, and the whole valley kept this picturesque and prosperous look. It was then that things started to change. Let us look at the valley through the eyes of Clayton M. Hoff, chemist, physicist and nature lover, as he saw it in 1942.

As president of the Wilmington Trail Club and an ardent out-

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doorsman, he roamed the valley persuading farmers to let his club build a hiking trail along the Brandywine. An expert photographer, he carried along his camera to record the valley's lovely scenes. But it was not long before he began to notice something wrong. There were lovely scenes, but his rambles also took him past a profusion of ugly ones: Eroded fields, unsightly rubbish dumps, open sewers, overgrazed pastures, gullies big enough to swallow a tractor.

He was even more shocked and distressed when he began to dig out the facts behind these sights. He learned that the valley's wonderful soil — so fertile it would grow three times as many bushels of corn per acre as the national average—was being horribly depleted, with 60 per cent already gone! A million dollars worth of it a year clogged up the channel downstream at the Wilmington Marine Terminal, and had to be dredged out at the rate of 12 inches a month! The eroded hillsides, unable to soak up water, sent it raging down into the river every spring, causing worse floods each year. Sewage and industrial pollution added to the decay of the river, killing fish and wildlife and endangering public health. As in far too many regions, the life blood of the land had been shoveled into the river.

When the hiking trail was completed, Hoff decided to put his pictures to work. He knew the Brandywine Valley was a sick valley, and he was convinced that its sickness could be cured only by the concerted efforts of all its people. So he called a meeting of 35 residents of the valley. He showed them slides of his photos —of raw sewage spewing freely into the river, of chemical wastes from steel and paper mills, slaughterhouses and numerous other industries, of deep, ugly gullies like open wounds on hillsides and pastures, of wonderfully rich topsoil making their once lovely river a sullen chocolate brown. He told them of the terrific cost of this pollution and of the waste of land resources. He showed them how what happens upstream on any waterway affects everyone along that waterway—their health, their happiness and their pocketbooks. He cited the great annual toll of floods. He told them that 75 per cent of our flood and erosion damage occurs, not along great rivers like the Mississippi and Ohio, but on the watersheds of our thousands of small headwater valleys, the best country for farming and living.

Lost topsoil causes more than higher food prices for Americans. It silts up reservoirs, necessitates the building of expensive dams and levees downstream, makes water supplies impure, and fills shipping channels and power

reservoirs with sediment that has to be dredged out. Two billion dollars annually, say conservation experts, is a conservative estimate of the cost of this damage. The local damage in the Brandywine, said Hoff, easily ran into the millions. Hoff closed his talk with the quiet words, "What are we going to do about this?"

What they did about it is what every region can do where there is such need. First, they organized the Brandywine Valley Association, a nonprofit, nongovernmental organization dedicated to rehabilitating the valley. Hoff, giving up his job as head of Du Pont's electroplating chemicals division, was elected full time executive vice-president. Annual dues were set at two dollars, or as much more as a member might want to contribute. From that nucleus, the BVA has grown to 1,100 members and a $36,000 annual budget.

The method of attack on the problem was simple and effective. Hoff, with forester Howard Mendenhall and agronomist Robert Struble, brought the BVAA's message to the 200,000 residents of the valley. To anyone who would listen, they showed their pictures and gave lectures day and night, at businessmen's meetings, farm and garden clubs, school classes, women's clubs, scout troops, chambers of commerce. Once interest was aroused, they helped each group to organize and do the job it was best suited for. With technical help and advice from government and private agencies —but never more than advice or technical help, for, in the traditional American pioneer spirit, this was a project of the people of the valley alone—each organization got to work.

Pollution was one of the biggest problems. Public indignation helped out with that. New and improved treatment plants sprang up in towns that had formerly poured their human wastes indifferently into the Brandywine. Industrial users co-operated willingly in some cases; in others, a gentle hint regarding Pennsylvania's new pure stream laws was necessary before the plants would install equipment to purify their wastes.

The valley's 2,500 farms were next on the list. Here Hoff's camera again proved the clincher. He took his slides even into farmers' living rooms, and the shots of deep gullies and pitiful washed fields, coupled with statistics that showed that on just one day in 1947 nearly 14,000 tons of topsoil eroded into the Brandywine, woke up every farmer.

Strip cropping, contour plowing and other modern methods now hold back this precious soil. The Chester County Soil Conservation District, organized in March, 1948, has already filed

900 complete farm plans. Last year alone over 5,000 acres of eroded marginal fields were converted to soil conserving pasture grasses. Multiflora rose fences and wildlife food strips now dot the countryside, encouraging birds, game and pest destroying wildlife. Over a million trees have been planted on thousands of hillside acres by Valley farmers, aided by youth groups. Farm ponds were established on some 70 farms providing fish to eat and fire protection.

The BVA for four years has helped sponsor a three weeks workshop at two colleges to train teachers in "how-to-do-it," practical conservation of local natural resources. It also has an annual contest for Future Farmers of America, inspiring them to introduce conservation practices on their families' farms, and awarding the winners trips to the Department of Agriculture's experiment station at Beltsville, Maryland.

To draw attention to its aims, the BVA performed a "Two-Day Miracle" for thousands of interested onlookers on one farm. A five year complete conservation plan was put into operation in two days. Anyone who might have been skeptical as to the value of a good conservation program went away from that demonstration with his mind very definitely changed.

The Brandywine Valley is now distinctly nature conscious. School and community forests are springing up everywhere. The West Whiteland School Forest, planted five years ago, boasts trees taller than the children who planted them. And, like the farm woodlots whose products are processed and marketed by a co-operative sawmill set up by forester Mendenhall, they both beautify the landscape and show a tidy profit from what was once wasteland.

These and other projects undertaken by the association are having a big effect on the valley. Of course, the job is by no means done. Conservation demands eternal vigilance. But already erosion and silting are reduced at least one-half. Pollution control is virtually complete. Sportsmen report that hunting and fishing are improving remarkably—a 6½ pound bass was hooked last summer! Crop yields are rising on conservations farms, and floods are losing their severity. Before-and-after pictures show that its old-time beauty is coming back to the valley.

The waste and carelessness and exploitation that have ruined so many lovely areas and thrown away so much of our precious land resources cannot be tolerated any longer if we are to remain a great and prosperous nation.

What It Costs to Harvest Grass Silage

Condensed From Iowa Farm Science

Raymond R. Beneke and Thomas Payne

Beneke is Associate Professor of Farm Management; Payne is a former graduate student in agricultural economics.

YOU can do a better job of weighing the advantages of grass silage if you know what it costs.

To pin down the problem, we analyzed the change in harvesting cost occurring when a farmer who normally puts up 30 acres of hay changes to ensiling 20 acres of the first cutting. If the hay normally yields three tons per acre, he'd be changing from putting up 90 tons of hay to putting up 60 tons of hay plus 80 tons of silage. We found this to be a typical change on the farms we studied.

Total cost of moving 30 acres of forage from windrow to storage under the two situations is compared in table 1. Costs are given for five different methods used for haying. These are compared with the cost of ensiling part of the crop with a custom owned chopper except in the case where the operator owned the chopper.

Cost estimates are based upon average performance rates of these machines under farm conditions. We've charged all labor at $1.25 per hour plus $12 per hour for the field chopper and other special equipment and two men usually furnished by the custom operator.

While there was a great deal of variation in the charge being made for custom work in the area we studied, we found $12 per hour to be the most common 1951 rate. The grass silage cost, on a per ton basis (including all labor) was about $3.25 where equipment was custom hired. To compare this cost directly with haying costs, remember that it takes two and two-thirds tons of 70 per cent moisture silage to equal one ton of 20 per cent moisture hay on a dry matter basis.

In all the situations we studied, ensiling part of the crop resulted in higher costs than using it all for hay. But how much the costs increased depended upon both the haying and ensiling methods used.

The *smallest* added cost from making grass silage came where the operator was equipped with a field chopper of his own for

Reprinted from Iowa Farm Science, Ames, Iowa

haying. Here he was already standing the heavy fixed cost on the field chopper. The *greatest* added cost came where the operator owned a baler but not a chopper. Here he still had to stand the fixed cost on a baler—a large part of the baling cost—even though he reduced the number of tons of hay harvested and baled. In addition he had to pay out money for the services of a field chopper. On farms with as small an acreage of forage as used in the example, ownership of either a baler or field chopper is not economical.

In many cases the increase in out-of-pocket costs from the addition of grass silage will be greater than indicated in table 1. While the size of the crew varied from three to seven on the farms we studied, we found that under most conditions four or five men are needed to put up grass silage efficiently. Thus you may have to use more hired labor than for most haying operations. So while we charged all labor at $1.25 in table 1, a greater amount of the labor bill may be a cash cost when you make grass silage.

Added costs given in table 1 are *over and above* the cost of harvesting forage in the form of hay. So they must be weighed against the added return you expect to get from making grass silage.

Making silage increases the yield of feed nutrients per acre by reducing loss in the harvesting operation. And a higher proportion of the most costly feed nutrients such as protein and carotene is saved by making silage. As a farm operator, you'll want to be sure you can profitably use more and better quality forage before you incur the added cost of obtaining it.

Once you've decided to make grass silage, your problem is one of planning an economical machine arrangement for harvesting *both* hay and silage. All farm operators we interviewed used field choppers to harvest grass silage. Several reported they'd used a hayloader and stationary silo filler in past years but had given it up because of high labor requirements. (Studies show that at least twice as much labor is involved with the loader and stationary filler as with the field chopper.)

Where both hay and silage are harvested, you can work out a variety of machine arrangements. We've compared the costs of harvesting different acreages of a combination of hay and grass silage with five different machine arrangements (see table 2). These costs have been worked out for a common forage combination where two-thirds of the first cutting is put up as silage and the remainder of the crop as hay. Costs apply only to moving the forage from windrow to storage.

Resulting tonnages of hay and grass silage which would be harvested from a given acreage (based on a three ton hay crop) are shown in columns 2 and 3 of table 2. Again costs are based on average performance rates under farm conditions and include a charge of $1.25 per hour for all labor.

The comparisons emphasize the cost advantage of using a field chopper on both hay and forage where they are produced in combination. But the high fixed cost involved in owning a field chopper and the equipment to go with it makes actual ownership uneconomical where forage acreage is limited. Our costs indicate that it's cheaper to hire a field chopper where less than 50 acres are harvested. And if capital is limited, it may be to your advantage to hire a field chopper even though it's used for more than 50 acres.

Your guiding principle here is to decide whether putting more money into forage harvesting equipment will mean diverting it from more productive investments such as livestock, feed or fertilizer.

Using a field chopper on a limited acreage can also be made more economical through shared ownership. In this way fixed costs per year can be cut in half for each operator—reduced by about $200 in the case of the field chopper and special equipment. The cost of owning a field chopper as it applies to making grass silage is reduced similarly if you also use it to make corn silage.

Some farmers have had difficulty in getting work done on time when they depend upon a custom operator or jointly owned machinery. But only a quarter of the farmers included in our study owned the field choppers they used. The rest hired the chopper on a custom basis or owned the machine jointly.

There are other things, however, besides costs alone that may influence your choice of a machine arrangement. Some farmers object to chopped hay. Where this is true, owning a field chopper is out of the question unless very large acreages are made into silage. This generally means hiring a custom chopper for silage and either baling the hay or putting it up with a hay loader.

If you own a chopper and part of the forage crop put up as hay is baled or put up with a loader rather than chopped, your costs are increased that much more. This is particularly true when you use the baler for only a limited acreage. But many farmers are willing to stand the greater cost of baling in order to have the hay "done up" in a form which can be conveniently stored and fed. A number of farmers apparently make grass silage only as an

TABLE 1

Thirty acre comparison of the total cost including all labor of putting up 90 tons of hay with the cost of making 60 tons of hay plus 80 tons of grass silage;* field chopper and special equipment hired except where owned by operator.

Method used to put up hay	Total cost when all put up as hay	Total cost when 20 acres ensiled**	Added cost of ensiling 80 tons
Hay loader	$453	$587	$134
Hire baler	507	600	93
Own baler	707	861	154
Own field chopper	645	698	53

* Based on forage yielding 3 tons of hay per acre or 1.5 tons of hay and 4 tons of grass silage. Cost includes all labor charged at $1.25 per hour.
** Field chopper and special equipment custom hired except in last comparison where field chopper is owned by the operator.

TABLE 2

Total cost of harvesting a combination of hay and grass silage with different machine arrangements; two thirds of first cutting ensiled, remainder put up as hay.

Acres forage harvested	Tons hay harvested	Tons grass silage harvested	Own field chopper	Total Cost: Hire field chopper	Hire field chopper and own hay loader	Hire field chopper and hire baler	Hire field chopper and own baler
20	40	53	$ 611	$ 354	$ 414	$ 399	$ 700
40	80	106	789	707	758	797	1,019
60	120	159	957	1,060	1,101	1,195	1,336
80	160	212	1,140	1,414	1,446	1,594	1,655
100	200	265	1,303	1,722	1,791	1,993	1,974

emergency measure in case of bad weather and don't plan to make it every year. Hiring the field chopper seems best under these conditions — especially where it won't be used for a large acreage.

We haven't considered in this article the labor costs involved in feeding grass silage. A number of farmers in the study said it required more labor to feed grass silage than hay. This is partly because a greater tonnage of feed in the form of silage must be handled.

Silage often is fed at a time of year when the operator isn't pressed for time. But when you are locating your silo, remember that silage must be "taken out" as well as "put in." Proper location will reduce the amount of heavy work in feeding silage.

On July 1, farm wage rates, without room and board, averaged 87 cents an hour for the country as a whole. The average in the south was from 54 to 64 cents.

Ag Engineers Reveal Immense Water Reservoir Capacity Right Under Your Feet . . . Challenge New Developments in Conservation

MOTHER EARTH CAN TAKE A BIG DRINK

Condensed From Agricultural Engineering

L. L. Harrold

USDA Soil Conservation Service

CONSERVATION, like Cleopatra, hath infinite variety. Perhaps because it has had the greater welter of publicity, not to mention the wealth of public funds, the popular image of agricultural conservation is the control of water erosion, or soil washing. So keen is attention focused on the soil that few among us have noted that the water, too, is awasting.

Not so in sections of Ohio, where continued fall of the underground water table has alarmed industries and municipalities alike with the threat of failing water supplies. And at Coshocton Experiment Station of the United States Soil Conservation Service, in that state, studies are afoot to learn how soil can be handled to save both it and its counterpart, rainfall.

The soil studied was Muskingum silt loam. Going down 40 inches — about as far as roots reach from any common crops— and measuring the water content for a whole year, this soil was found in March to contain water equal to 14 inches of rainfall. Obviously its capacity is at least this much — 380,000 gallons per acre—and any amount less than this means storage capacity going unused.

From May onward the water content sagged steadily until in September there was less than five inches — two-thirds of the capacity going unused. Yet in that month, with room for over nine inches of rain, corn land lost more than two inches of rain by run-off. Rains earlier in the summer had suffered varying losses by run-off, all less than vacant storage space, and all taking with them tons of precious soil.

Of the 40 inch depth studied, all but the first seven inches was subsoil. Like many subsoils, it was comparatively impermeable.

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St. Joseph, Michigan

Hence the 14 per cent of available pore space could "take water" only at very slow rate. In contrast, the seven inches of topsoil had a structure which took water readily and rapidly, *if* that structure was maintained, as when protected by an overgrowth of grass or other such vegetation.

But when exposed to bombardment by raindrops, the coarse crumbs of soil were pelted into fine particles which settled into the pores and sealed the surface against prompt admission of water. In a hard rain with big drops, this sealing is almost complete within a few minutes. This is what happens to open tilled land, or in clean cultivated crops such as corn.

One approach to the problem is the use of chemicals which stabilize the soil structure and make it comparatively immune to breakdown and sealing. It has been demonstrated that this can be done, sometimes with spectacular success, but—at least for the present—the cost is too high for general use.

Another, and presently more economic approach, is to fortify the surface against bombardment by rain, using something—almost anything — which will stop the force of the falling drops. This is mulching. To some extent it can be done during preparation of the seedbed. Several sequences of operations with various implements have been tried and others are to be tested.

All are based on the idea of bringing to the surface more or less of the sod, stubble or other vegetative debris remaining from prior growth. All are successful to a degree, depending on the amount of debris existing and the extent to which it is brought up to the surface during preparatory tillage. Seldom is there sufficient for a complete mulch, but every little helps.

Another and generally more adequate expedient is to haul in and spread mulch material after the corn or other row crop is planted, or after it comes up. Strawy manure, applied with a regular spreader, serves well, especially when put on after the crop is up. It then lasts later into the season, and if all equipment is properly used it does not prevent adequate cultivation and weed control.

Also tested experimentally was a mulch of spoiled hay, put on by hand after the last cultivation. Especially effective when the crusted surface was broken before mulching, it enabled the topsoil to absorb and retain two and a half times as much moisture during an August drought, and the corn yield was greater by 16 bushels per acre.

Other procedures to be tried are use of a forage harvester to blow mulch material onto the

intertilled crop, and a two level method of seedbed preparation. This consists of very shallow plowing, to keep plant debris at or near the surface, combined in the same operation with deep stirring of the soil by a subsweep.

Efforts to improve water absorption by the subsoil are thus far of scant promise. Shattering to a depth of 18 inches improved the percolation, but only for a short duration. Nor did a decade of conservation farming, with a rotation including alfalfa-timothy meadow, make any measurable improvement in the subsoil itself.

All this spadework shows that sheltering the surface from direct impact of rain can make great savings of both soil and water. Much remains to be done in working out implements and procedures to make mulching effective through a maximum amount of time, with minimum outlay of labor and material, and all dovetailed into high yielding crop production. It is a job for agricultural engineers, abetted by agronomists and soil scientists.

Report on X - Disease

It may be possible to reduce, or eliminate entirely, hyperkeratosis (X-disease) in cattle on many farms if they are kept away from tractors, combines, bulldozers and other farm machinery where they may eat grease or oil.

That's the conclusion based on research conducted by 17 state agricultural experiment stations co-operating with the United States Department of Agriculture.

Representatives from the various experiment stations said that used crank case oil, old oil drums and similar containers should be kept away from cattle; and drainage from around grease racks and in farm machinery sheds should not be allowed to contaminate lots or pastures to which cattle have access.

They agreed that cattle may become affected with X-disease by exposure to, or eating, highly chlorinated napthalenes contained in certain lubricants, or by unknown toxic ingredients in feedstuffs. The researchers have been able to produce the disease experimentally by giving the suspected feeds under controlled feeding tests in neighboring regions as well as in their own states. The disease has also been produced with particular batches of processed concentrates, roofing asphalt and timothy hay from one certain field.

Research will be continued to investigate other possible causes of X-disease, and products that might contain toxic chemicals. Attempts will be made to develop methods of prevention and control.

University of Virginia

Balbo Rye — Two Cans a Day Extra

Condensed From New Jersey Farm and Garden

E. J. Perry

A WELL rounded program of full season grazing and high quality roughage for winter feeding was the goal set by F. Rollo Davis, New Jersey dairyman. When the green pasture judges visited the Davis farm last August, they agreed that Davis was reaching his objective.

To feed his 35 milking Holsteins, Davis uses a combination of balbo rye for fall and spring grazing, ladino-orchard and ladino-bromegrass mixtures for pasture, grass silage and hay, and sudan grass for midsummer pasture. Fact is, says Davis, he turned his milkers on 12 acres of balbo rye last year, "and milk production jumped two cans per day."

Davis also has 10 acres of lush ladino-brome, and 24 acres of orchard grass - bluegrass - clover (just under one acre per cow) for pasture purposes. Six acres of ladino-alfalfa-brome, 10 acres of alfalfa-timothy and 31 acres of straight alfalfa round out the roughage picture (except for several acres of sudan grass kept in reserve for midsummer grazing).

Excess pasture during the flush season is made into grass silage for winter feed, and to assure top quality hay, for the past two years Davis has used a hay crusher which has helped to cut down on the field curing time of alfalfa hay.

The fertilizer program on the legume pastures and hay fields includes 500 pounds of 5-10-10 at seeding and 500-600 pounds of 0 - 19 - 19 topdressed annually. Some manure is also used on pastures containing bluegrass. This practice, combined with regular clipping, keeps his pastures lush and succulent throughout the growing season.

Davis' grain feeding practices also warrant special consideration. With high quality roughage, he feeds one pound of grain for each six pounds produced in the winter and widens this to one to eight when cows are on pasture. With a similar program in 1950, his herd averaged over 12,000 pounds of milk and 422 pounds of fat in official DHIA tests.

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All-Risk Crop Insurance

Protecting Farmers Against Unexpected Hazards

Condensed From Agricultural Situation

John C. Ellickson

Bureau of Agricultural Economics

A FARMER'S best laid plans can be upset by a short crop. Except for hail damage, short crops are usually the result of losses which are not insurable through private insurance companies. This is where the all-risk crop insurance of the Federal Crop Insurance Corporation comes into play . . . a program that was started with certain limitations but one that is reaching more and more farmers as experience is gained in a new field.

Drought, frost, insects and disease are more serious crop hazards than hail. A number of private companies have attempted to insure farmers' incomes against all unavoidable risks to their crops. But these attempts failed, mostly because of the decline in farm prices that followed World War I. Since 1933, the commodity loan and price support programs of the federal government have provided some protection against falling prices. Losses from drought and other yield hazards, on the other hand, are not protected by the price supports.

Difficult to Cover

The possibility of widespread losses, as occurred in the drought years of 1934 and '36, makes all-risk insurance an unattractive field for private companies. Even the government, when it undertook to set up all-risk insurance, found it advisable to start in a limited way and to broaden the program gradually, in the light of experience.

In 1938 congress passed a law whereby the Federal Crop Insurance Corporation was established to develop a system of all-risk crop insurance. In order to avoid the earlier difficulties it was decided to insure only production, not price. Almost all risks were to be insured except those resulting from a poor job of farming. Recognizing the many difficulties and also the public benefits, congress appropriated money for

Reprinted from Agricultural Situation,
Washington, D. C.

operating costs. But it was expected that premiums should be enough to pay losses in the long run. Wheat was the first crop insured in 1939, and cotton was added in 1942. By the end of 1943 losses had exceeded premiums on both crops in every year of operation and congress decided to end the experiment.

No insurance was offered in 1944, but the demand for this kind of protection was so great that a revised and improved program was begun in 1945. Flax was added to the crops covered, and insurance on corn and tobacco was tried in a few counties. The experience for the next three years was better. Every year premiums exceeded losses on wheat and tobacco. But the deficits on cotton continued.

Congress again changed the law. The program was limited to about 400 counties in 1948 but more counties were added in later years. The amount of insurance coverage per acre was also limited to the average cost of producing the crop in the area. Authority was given to experiment with different plans of insurance and to include additional crops. Dry edible beans were first insured in 1948 and citrus in 1951.

Experience had shown that losses and premium costs to the farmer could be kept at a reasonable level only by reducing the amount of insurance coverage per acre. Coverage was reduced from 75 per cent of the average yield down to the average investment in the crop. The coverage was also decreased early in the season, before additional expenses were incurred for cultivating, spraying or harvesting the crop. The regular premium rates were increased or reduced when experience in a county indicated that this was necessary. In addition, when premiums exceed losses over a period of years—so that a reserve is accumulated equal to the largest loss which reasonably could be expected in the county—premiums are reduced by 30 per cent for all farmers who have been insured. This reduced rate is continued as long as the county maintains its reserve. A total of 146 counties received this premium discount for the 1952 crop season. But if total losses are considerably more than premiums in a county, the rate is increased, sometimes as much as 30 per cent. This year there are 51 counties in which the premium rate has been increased because of excessive deficits.

Lower Premiums With "Multiple" Policy

In the early years of the program, all-risk insurance was used to cover individual crops. In 1948 a "multiple crop" policy was first offered in a few counties. This new policy covered most of the crops usually grown. Under

this policy, the *total investment* in all insurable crops on the farm was covered as a unit. Even if one or two crops failed, the others might produce enough to equal the insurance and no loss payment would be necessary. Therefore, lower premiums could be charged.

As an incentive for good farming practices, any farmer who insures for seven consecutive years without a loss receives a premium discount of 25 per cent; and a 50 per cent premium discount is allowed each farmer whose premium reserve (premiums minus losses) is greater than the amount of his insurance. These provisions, together with the continuous contract used on most crops, helps to reduce operating costs and the number of "in and outers" who buy insurance only when they expect a poor crop.

The premiums usually become due after the crop is harvested, but a cash discount of five per cent is allowed for early payment.

By means of these devices, a farmer who has had favorable crops and who lives in a county fortunate enough to have had only small losses can buy his insurance for much less than the initial rate. On the other hand, some farmers and some areas are ruled as extra-hazardous and are therefore ineligible for insurance.

Twelve years' experience with all-risk crop insurance has shown that unexpected crop losses can and do occur in any county. Many counties in which the risk of loss was considered low have failed to build up reserves. In others, in which the risk was considered very high, large reserves have been accumulated because of a succession of good crop years. But in most of these counties the entire reserve could be paid out on one poor crop. Flax is generally considered to be a high risk crop, yet losses have been less than premiums in six out of seven years. On the other hand, losses on corn have been greater than premiums in four out of seven years.

From 1948 to 1951 about two million dollars more in premiums were collected than were paid out for losses on all types of contracts combined, so all-risk insurance now appears to be functioning as intended.

The Federal Crop Insurance Corporation is authorized by law to reinsure any company that attempts to provide crop insurance, but no such agreements have been reached.

In 1952 about a third of a million farmers in about 800 counties will be insured under federal crop insurance. The average coverage is a little more than $1,000 each.

More insurance is now carried on wheat than on any other crop, with tobacco and multiple crop insurance about tied for second place. The multiple crop program

has grown rapidly since it was started in 1948, and it may be the leader within a few years.

Insurance is more necessary now than it was a generation ago. The cost of modern equipment is higher and unit operating costs have increased.

The pioneer farmer tightened his belt when crops were poor or times were hard, but in a cash economy there are many expenses that cannot be reduced. If crops fail, a farmer with limited capital might not be able to continue farming. Crop insurance fills the gap . . . helps to assure a return on the farmer's investment and makes it easier for him to get credit for the next year.

New USDA Yearbook Features Insects

Publication of the 1952 Yearbook of Agriculture, a 952 page volume entitled "Insects," has been announced. The new yearbook is designed to be a practical aid to farmers in identifying insects, making better use of the helpful ones, and controlling the pests that cause an estimated four billion dollars of damage each year.

An outstanding feature is a section of 72 color plates of the important insects of the United States. The drawings depict the life stages of the insects and the damage they do. Opposite the drawings are descriptions and control recommendations. In addition, eight black and white photographs and more than 200 line drawings will help readers identify insects.

The yearbook begins with general discussion about the number of insects, their history, how they live, what they eat. A key to insect identification and information about making collections follows. A chapter "Insects as Helpers" includes articles on pollination by honey bees and other insects, bee breeding, the effect of insecticides on bees, and weed control by insects. The destructive species are discussed in the next chapter—those that transmit diseases of plants, animals and humans, as well as those that destroy crops and livestock by direct feeding.

The second half of the book is devoted to the major pests of people and their homes, cotton, vegetables, fruits, field crops, ornamentals, livestock, trees, and wildlife.

The yearbook is produced in the department of agriculture as a congressional document. Its main distribution is by members of the senate and house of representatives. Copies are also for sale at $2.50 by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Pastured Pork Costs Less

Condensed From Eastern States Cooperator

C. W. Clemmer

GOOD pastures are the answer if you want to make hogs more profitable.

An acre of good pasture should carry six to eight mature, bred sows with no supplemental feeding to within six weeks of farrowing. The forage provides all the nutrients, vitamins, minerals and growth factors needed for maintenance and reproduction until the approach of farrowing time when a moderate, very simple supplemental feeding contributes to a normal litter and milk supply for the suckling pigs. This supplemental feeding should continue until weaning at eight weeks after farrowing when the pigs should weigh 35 to 50 pounds each. A creep feeder for the little pigs will permit giving them a higher protein supplement than the sows need.

For pasturing young growing and fattening pigs, an acre of good forage should carry 15 to 20 head while they are on full feed if you are striving for rapid gains to meet an early high market. On more limited feeding to make greater use of the pasture, the carrying capacity of an acre would be reduced about one-third to one-half depending on the condition of the pasture and the weight of the pigs. In most instances there should be a saving of 10 to 20 per cent of grain and 30 to 50 per cent in protein supplement compared with dry-lot feeding. A saving of 500 to 1,000 pounds of grain and 300 to 500 pounds of protein supplement per acre is important, though only one of the many benefits of pasturage. Pigs should attain their marketable weight from 10 days to two weeks earlier and make larger average daily gains on pasture.

No protein supplement is needed for growing or fattening pigs on good pasture with full feed allowance after they reach a weight of 125 pounds. When on a limited feed program, pigs need no protein supplement for best utilization of the forage after they weigh 75 pounds. Most economical gains are made when pigs are marketed at 225 pounds or less.

Reprinted by permission from Eastern States Cooperator, Springfield, Massachusetts

At heavier weights more feed is required for each pound gain in live weight.

There are less nutritional deficiencies in a pasture system of management than with dry lot feeding. Exercise, sunlight and the abundance of vitamins, minerals, nutrients and possibly some unknown growth factors tend toward larger, more thrifty litters, less runts, and stronger bone growth. Sanitation is more easily provided, resulting in less parasites and a minimum of disease.

When hogs and growing pigs have had the benefits of good pastures they accumulate a considerable reserve of vitamins, minerals and growth factors which they carry into the winter feeding period. The effects of this can be observed in better health, strong litters and more efficient feed utilization in winter confinement. Growing pigs can consume advantageously high quality grass silage up to 15 per cent of their nutrient requirements and mature hogs or bred sows will eat profitably 10 to 15 per cent of their ration as sound, dry, leafy, legume hay. Hogs cannot benefit from eating coarse, fibrous roughage.

There is a saving of labor in caring for hogs on pasture when self-feeders, water and shelters are conveniently located as compared with dry-lot feeding. Furthermore, the manure, which contains 75 to 80 per cent of the fertility constituents of the feed consumed, is well distributed over the land with less loss since there are no leaching, fermentation and handling losses. In dry-lot feeding, about one-half of the fertility value of the manure is generally lost. Where proper drainage is provided from the water supply there need be no objectionable mud wallows.

In order for land to produce a good hog pasture it should be in a high state of productivity. Most forage crops do best at pH 6 to pH 6.5. A soil test, a history of preceding crop growth, and the soil type should guide one in the rate of lime to apply. Lime can be safely applied at any time, but it is best to incorporate it with the soil to plow depth at time of seedbed preparation.

Best yields require that a soil contain from five to 10 times as much of the immobile nutrients as the crop will remove in one season. All nutrients, except nitrogen and water, are considered immobile. A ton of dry matter in young grass of 20 to 24 per cent protein is equivalent to 65 to 75 pounds of nitrogen, 30 pounds P_2O_5 and 70 pounds K_2O. The season's yield may well exceed three tons dry matter per acre. The specific lime and fertilizer applications required will depend somewhat upon the soil analysis, legume growth, if any, the manure applied previously

and the soil type for the crop desired. In rotation grazing, fertilizer should be applied at each interval to provide ample available food for renewal growth.

Native sods of Kentucky bluegrass and wild white clover, even at high fertility levels, will provide little grazing in midsummer, although excellent in spring and late fall. Any of the hayland-pasture mixtures used in crop rotations afford splendid forage for hogs up to early bloom stage of the most advanced species in the mixture. Grasses, such as orchard, Reed canary, brome, timothy and similar types, should not be allowed to develop beyond the prebloom stage. Their young, leafy, succulent stage is most desired.

Cereal grains as rye, wheat, barley and oats should be grazed before joints develop in the stem. A heavier than normal rate of seeding, up to 200 pounds or more of seed per acre is justified in striving for maximum vegetative growth for grazing at a height of five to six inches. An acre should carry five to six sows with their litters for eight weeks in the following spring where fall grains are seeded. Hairy vetch may be added at 30 pounds per acre or crimson clover at 10 pounds per acre in the south. Lespedeza is often used to good advantage where adapted. Lespedeza should be seeded in the spring, preferably alone or with a grass mixture.

A Suggested Pasture Schedule for Hogs

Kind of Crop	Date Sown	Lbs. Seed Per Acre	Period of Grazing at High Fertility Apr. May June July Aug. Sept. Oct. Nov.
* Rye-Vetch	Aug.-Sept.	70-30 100-200	....
** Ryegrass	Aug.-Sept.	25	....
Oats—Peas	Mar.-Apr.	100-50	.....
D. E. Rape	Apr.-July	15-20	....
Sudan	June	20	.....
Soybeans	June	50-100	.....
Lespedeza	Mar.-Apr.		.....
Ky. Bl.—Wh. Cl.	—	—	....
Hay—Past. Mix.	Apr.-Aug.	10-12	....
Alfalfa	Aug.	10	....
*** Brome	Aug.	10	
Birdsfoot Trefoil	Aug.	5-6	....
*** Timothy		4-6	
Corn	May		.....

Grazing periods for alfalfa, ladino and birdsfoot trefoil depend on local conditions. Allow ample time for recovery after each grazing period.

* Wheat may be used instead of rye and vetch replaced by crimson where adapted.

**Ryegrass may be replaced by annual field brome when seed is available.

*** Timothy and brome are interchangeable with alfalfa, ladino or birdsfoot trefoil.

Annual crops — dwarf Essex rape, field peas and soybeans— are used in rotation grazing, the rape or field peas planted in early spring with oats, the soybeans planted in late May or June, and the rape again in late summer for a late fall crop. The soybeans should be grazed when the pods are well filled and as the lower leaves start turning yellow. (See table for seeding rates.)

Ladino clover and alfalfa are the best legumes for hog pastures. They should be pastured at short intervals intensively and allowed ample time for recovery. Ladino is grazed when eight inches tall and stock removed when two inches of growth remains. Alfalfa is grazed when at the quarter bloom stage and what is not grazed within a week should be clipped and preserved as silage or hay and the area allowed to recover new growth for five to six weeks before grazing or cutting. In the fall there should be three weeks or more of good growth left standing for the winter; otherwise root reserves will be depleted and winter injury may result.

Ladino and alfalfa may well be combined with smooth brome, orchard grass, Reed canary or timothy provided the grasses are grazed in a young, leafy, succulent stage without depleting the legume in the mixed stand.

When corn is hogged down after it is well in the dent stage, there should be either a good intercrop of domestic rye grass that had been seeded in early August in the corn or an adjacent area in good hog pasture for alternate grazing at intervals each day. Some consideration should be given to planting a hybrid corn of much earlier maturity than the region requires for safe maturity. These earlier kinds are usually shorter in plant height allowing closer spacing at high fertility and better penetration of sunlight to benefit the intercrop. An extra application of nitrogen just prior to seeding the intercrop tends to increase the protein content of the corn and stimulate growth of the intercrop.

All animals that are fed waste products should have access to green, leafy forage as a protective influence against improper constituents of the waste consumed.

Exercise in sunlight is so essential for breeding stock that special provisions can be made for them while grazing by locating the feeders and water supply at some distance from the shelters, usually at opposite ends of the lot.

Poultry Shelter Serves Dual Purpose

Pole Type House Increases Output, Decreases Investment

Condensed From American Poultry Journal

William Gilman

HAROLD McEACHRON had been hearing how easy and economical it was to build one of those pole-type barns —and how satisfactory is was afterward. But that was for dairy cattle.

In the winter of 1949-'50, he began figuring how he could do the same thing in the way of a new henhouse on the dairy-poultry farm which he and his father operate near West Hebron, in Washington County, New York.

Costs 50 Cents Per Square Foot

The building went up the next spring and has had two summers of successful use. It went unharmed through the November, 1950, hurricane, and proved that it was just as durable as it was handy.

The single story, barracks type structure cost $5,000, with a little of the work done by the farm's hired help, the rest by a three man crew of carpenters. It is 50x200 feet, which figures out to a cost of slightly over 50 cents per square foot, or $1.25 per bird.

Serving as a summer barracks, it enables Mr. McEachron to keep over his 4,000 best yearling hens for a second season's laying. This means that the "swing shift" older birds are laying large, high quality eggs at a rate of 50 per cent and over during the season when egg prices are high.

Besides this nice dividend from the older birds, the new building gives plenty of time and elbow room to prepare the year round henhouses for the replacement flock. McEachron has been starting about 7,500 White Leghorns in January. From them about 6,000 become the new flock which goes into the 13 pens of four other buildings.

Just before they are put into laying quarters, the older birds are culled, with the best 4,000 ending in the summer barracks. As a result, McEachron has two

Reprinted by permission from American Poultry Journal, Chicago, Illinois

flocks laying during the best season for eggs.

Pole Type Construction Eliminates Foundations, Etc.

McEachron holds on to the older flock as long as it keeps producing well, which takes the birds through October. They go into the summer building around the first of May. This means the layers stay healthy and untroubled by summer heat in the well ventilated structure.

The pole type construction gets away from excavations, footings and foundations. The earth floor was merely graded and given a light sprinkling of litter for the incoming birds.

Outer poles for the building's support were cut and split during spring slack season to measure approximately 6x6 inches. The poles were set four feet deep, 12 feet apart and they rise six feet to the roof eaves. There are 18 of them along a side.

For inside posts, which are also 12 feet apart, Mr. McEachron had locust logs rough hewn at a mill, where his instructions were to get 20 feet long poles, approximately 6x6 inches, out of the logs.

These posts, also buried four feet, rise 16 feet to hold purlines which support the roof at the point where rafters cross, half way down from ridge to eave. A three man crew put up the building in a month.

Summer Henhouse With Conveniences

The entire south side was covered only with chicken wire. Walls of the other sides are nailed direct to the poles and have hinged panels that open to provide cross ventilation. Galvanized roofing was nailed direct to rafters.

Although an economy building, this summer henhouse is one with "conveniences" — automatic watering fountains supplied by a half inch line from a deep well, and two rows of overhanging lights, each with a 40 watt bulb. All-night lighting begins in August and continues until the swing shift layers are sold off in November.

The main job of the four rows of poles, two inner rows and two outer, is to hold up the simple framing and the roof. The inner, carrying poles are cross-braced to rafters and purlines and support the purlines which in turn hold up the roof.

Building Planned for Easy Operation

Rafters are 2x6 inches, a couple of 16 feet ones spliced to provide the 30 feet from ridge to eave. Stringers tying the framework are 2x8 inches, 12 feet apart, crossing between purlines.

The grain room and entrance to the building's one big pen is midway down the south side.

Space is saved inside the building, and many steps saved, too, by eliminating rows of conventional laying nests ordinarily lined up throughout the structure. Production is concentrated in four laying rooms on the north side, where birds enter through their own floor level doorways. Eggs are collected from the community nests by entrance through a doorway serving the laying room.

Each of these rooms is 12 feet long, six feet wide, and has two sides lined with three tiers of nests. This makes a total of 72 feet of nesting space per room, each of which produces up to 14 cases a week.

The entire building was planned for easy operation. A manure spreader can be hauled through for cleaning. Roosts are movable double deckers without droppings boards or pits.

Steel Strike Hampers Production of Tractors, Farm Machinery —Recent steel strike will cause shorter supplies of tractors and other agricultural machinery in 1953, says Verl Houghaboom, Vermont extension economist. Most serious problem is crawler tractors, says the economist, as military orders for these are especially heavy. Presteel strike production was already behind schedule. And the strike delayed delivery schedules even more.

Supplies of bale ties and wire seem to be adequate for this year. Expanded production of aluminum sheeting for roofing should offset losses of galvanized steel. There has been a serious shortage of tin can metal this year, but shortage appears to be over and no perishable foods will be lost.

Animals Prefer Steps — Your livestock will be less apt to hurt themselves if your inclines and loading chutes are built with *steps*. For cattle, steps should be about two and three-quarters inches high and 16 inches deep. For hogs, the steps should be two and *one*-quarter inches high, and *12* inches deep. Animals will walk up and down these steps with much less slipping and exertion than if the older type of incline—with *cleats*—are used. *Utah Extension Service*

Dog Menace Met By Sheep Owners — Sheep raisers have three methods of reducing losses from dogs, according to Graydon Blank, Michigan animal husbandman and sheep specialist. Some put bells on several animals. Others run one or more goats with the flock. Still others run a cow and half with the sheep. Apparently a cow is more willing to stand her ground when a dog enters a pasture. Dog losses are always a problem for sheep owners. No practice can guarantee to keep dogs from killing sheep, he says.

New Cure for Trichomoniasis

Condensed From The Ayrshire Digest

A SUBSTANTIAL threat to dairymen in the form of a damaging breeding disease is being alleviated by Utah Agricultural Experiment station scientists. They've come up with new methods of diagnosis which can root out the evasive organisms which cause trichomoniasis.

Bovine trichomoniasis is appearing in every part of the country. Concerted efforts to diagnose and treat it are being made by Paul R. Fitzgerald, USDA collaborator, and Dr. Datus M. Hammond, zoology department head of Utah State Agricultural college. With the use of "Bovo flavin salve" first prepared in Germany they have so far cured nine of ten treated bulls. Possibly of greater importance are the better methods of diagnosis they're now using as the result of research on several techniques.

Most dairymen and cattlemen aren't aware of the damage for which trichomoniasis is responsible, and consequently they don't consider it much of a threat. Actually, while it isn't as widespread as brucellosis, it is every bit as destructive.

The researchers point out that most dairymen don't realize trichomoniasis is 100 per cent transmissable during coitus. Once a herd contracts the disease, the dairy or beef farmer will ordinarilly be forced out of business within two years.

The Utah scientists have diagnosed the disease in 14 Utah dairy herds since 1948. In eight of these herds, where actual records were kept, losses in calf crop and milk production were estimated to total more than $40,000, and the figure doesn't include the loss of valuable breeding bulls!

The scientists are sure that the disease is widespread, but because thoroughly effective methods of diagnosis haven't been available, it has not been recognized, ordinarily. It has frequently been confused with brucellosis, vaginitis and cystic ovary, because of the similarity of the symptoms. When it has been discovered, the bull has usually been slaughtered or given treatments which were long and laborious and effective in about 45 per cent of the cases.

Reprinted by permission from The Ayrshire Digest,
Brandon, Vermont

Usually the first suspicion of trichomoniasis can be detected from the breeding record of the herd. Common symptoms are failure to get cows settled with calf, some cows returning to heat regularly, while others are irregular. Breeding records for each individual in the herd are invaluable, because if trouble comes you can catch it early.

Diagnosis is made by microscopic examination of the fluid secreted in the sheath of the bull. The Utah scientists have found a douching method most effective. They douche the sheath with normal saline, recover the washings, centrifuge the fluid, and examine the sedimented material for the organism. They're presently engaged in determining the relative efficiency of several testing methods.

One difficulty the scientists have had to overcome is in growing cultures of the organisms, since so many contaminating bacteria are also present. Trichonomads won't grow in the presence of certain bacteria or if bacteria growth is very vigorous. But by using antibiotics, such as penicillin and streptomycin, to suppress bacterial growth, the researchers have managed to grow healthy cultures. In case this method fails, they use a test breeding of the infected or treated bull to a virgin heifer. The latter technique is almost 100 per cent accurate.

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Treatment is confined to the bull, since cows will respond with complete sexual rest in most cases. The "Bovo flavin salve," first prepared in Germany, is the Utah scientists present answer to the problem. This salve is massaged into the tissues of the reproductive organs after the animal has been given a local anesthetic.

This is the salve that has cured nine of ten treated bulls. The bull which didn't respond has been given two series of treatments, and may yet recover. It's the best method the scientists have found yet, and promises a much higher percentage of cure than they've achieved so far. Research now in progress in Europe using other cures may be even more effective, but further experimentation will have to be done for definite results.

A USDA circular circulated a little over a year ago answers the questions owners usually ask when their herds are infected. To help clear up confusion concerning the disease, some of them are reprinted below:

Q. What is bovine venereal trichomoniasis?

A. It is an infectious disease of cattle caused by a microscopic single celled organism, which brings about breeding difficulties.

Q. How is the infection spread?

A. Usually in the mating of an infected animal with either uninfected males or females, although infection has resulted from artifi-

cial insemination where semen was obtained from infected bulls. Like most animal venereal diseases, trichomoniasis is not spread through ordinary contacts, but only through natural breeding or artificial insemination. Infected and noninfected cattle can be pastured or housed together without danger of cross infection.

Q. How is the disease introduced into a previously uninfected herd?

A. Only through the introduction of diseased animals into the herd. These may be permanent additions to the herd. It may be an infected cow brought to your bull for service, or it may be animals sent to other herds for service and returned to the home farm.

Q. How does the disease affect (a) bulls, (b) breeding females?

A. (a) Bulls apparently are not affected physically by the infection, but they serve as incubators for the organism and become the transmitter without suffering any ill effect of infection. The infected bull continues to breed readily and there is no effect upon quantity, quality or fertility of semen.

(b) In females one of three things may happen as a result of infection:

1. Infected females may fail to settle in spite of repeated services:
2. Pregnancy may occur and the developing calf die and be aborted. Such abortions may take place in the very early stages of pregnancy and pass unobserved, or they may occur in from 30 to 120 days after service. In many cases unexpected return of heat periods after the animal had apparently been settled, is the only evidence that something is amiss;
3. Pregnancy may occur, the developing calf die and be retained in the uterus. In these cases the infected animals do not return to heat. Large quantities of pus may accumulate in the uterus to cause a condition known as pyometra. The cow behaves as if normally pregnant but at the end of what should be a normal gestation period shows no sign of "freshening."

Q. How long does the infection persist in (a) bulls and (b) females?

A. (a) The infection, for all practical purposes, is permanent in bulls. Rest from service does not clear up the infection. This is why bulls are considered the reservoir of infection. However, rare instances of bulls clearing up spontaneously have been reported.

(b) Females remain infected for varying periods ranging from three to six months or more. Females usually develop resistance as a result of one attack, but this

is not permanent.

The only means of avoiding infection is to prevent diseased breeding animals from being introduced into the herd.

This can be done by examining all bulls that have been in service in other herds before bringing them into your herd. Don't worry about young bulls which haven't yet sired, even though they come from infected herds. Females require close scrutiny, especially cows and heifers that are difficult breeders. They should be regarded with suspicion and refused service until reasons for the difficulty can be ascertained.

Breeding histories of other herds should be examined closely in case heifers and cows are given them for breeding. Keeping breeding records of each individual in the herd is essential to detect symptoms early.

It Costs More Now — Financing beginning farmers is an increasingly complex credit problem. Typical midwest farms represent large capital investments. Actual values vary, of course, with such factors as acreage, quality of land, amount and kind of livestock. Even at 1945 prices, the latest year for which data are available, the typical average investment in northern and central Illinois cattle feeding farms was in excess of $53,000. Cash grain farms in the same area averaged nearly $61,000. Wisconsin dairy farms averaged about $20,000 and Iowa and central Indiana hog farms about $26,000. Investment in general farms in central Michigan was a little over $18,000; in central and northern Illinois nearly $25,000. Costs have risen since 1945. Farm real estate, for example, is up 84 per cent in Illinois; 80 per cent in Iowa. The total value of machinery and motor vehicles on United States farms increased over 150 per cent from 1945-'51. Feeder steer prices are well over double the 1945 level and milk cows now average $254 per head, compared with $113 seven years ago. Growing farm mechanzation is an important factor in increasing the capital investment per farm. Each farm operator, working with more power and improved tools, can handle larger acreages. The result is economic pressure to enlarge the size of family farms and to increase the investment in real estate. But the investment in non-real estate assets is growing even more rapidly. Such items accounted for over one-third of total farm assets in 1951, compared with 28 per cent in 1940.

Federal Reserve Bank Agricultural Letter

Michigan's 4-H Fair Goes to College

No Midway, No Sideshows, No Carnival Rides . . .
Youngsters Take Over Michigan State for a Big Week

Condensed From Capper's Farmer

Grant Salisbury

MAYBE a state 4-H club fair without a carnival atmosphere in the background sounds like a dull affair. It's not a bit dull for the 2,000 boys and girls who take part in the annual show at Michigan State college. They're too busy handling exhibits, putting on demonstrations and participating in entertainment and recreation to miss the ballyhoo.

Work that goes with competition for state honors takes first priority — a dairy heifer to be scrubbed, a fat lamb to be blocked, final practice on a demonstration, a dress to be pressed for the style revue. Then there's the plowing contest or softball tournament to watch, the evening program in the auditorium, canoeing on the Red Cedar river, a double malt at the soda bar, or a chance to show mom and dad around the campus.

There's no more genuine pleasure than seeing 4-H spotlighted as it is at Michigan State. It brings out the absolute best in these boys and girls, the cream of the state's farm youth. Winning modestly, losing gracefully, they build up a spirit of comradeship that comes from sharing the same ideas and goals. At week's end they depart for their farm homes filled with determination to go on "making the best better."

Since the 4-H Fair is held in late August, between the summer and fall terms at Michigan State college, dormitories are available for those who earn the right to attend by winning in county and regional contests. Most of them sleep in the new Shaw Hall dormitory which will house 1,650. Everybody eats in the dining room of Shaw and its spacious lounges and the soda bar are available for spare moments.

Livestock — by their standards get treatment equally as good. Their "dormitory" is unique.

Reprinted by permission from Capper's Farmer, Topeka, Kansas

They are bedded down under the big football bowl at Macklin Field. There they are protected from the sun and rain and kept cool by the breezes. They are shown on the graveled areas which surround the bowl. At the 1951 fair 556 dairy cattle, 114 baby beeves, 285 sheep, 238 swine, 312 chickens and 123 rabbits were housed in these quarters.

This is probably the most visited spot during the show. It's a real pleasure to look over the fine livestock housed there. And it's a chance to sit down on a convenient bale of straw to rest and visit.

In the back and along the sides of the big auditorium are exhibits of flowers, vegetables, clothing projects, canned fruit, baked goods and achievement booths of the eight boys and girls who have been selected in the county and regional contests to compete for the most coveted honor of the year—a trip to the National 4-H Club Camp in Washington, D. C.

In these booths members pick some theme around which they build the story of their years in club work. The achievements of Ann Ullrey, Berrien county, illustrate the kind of 4-H record which makes one eligible for the finals. During her seven years in 4-H Ann was named to the county honor roll; she was in the dress revue honor group at the 1950 show; competed in the state finals in frozen food demonstration in 1949, in dairy foods demonstration in 1950; exhibited at the state show six years; completed projects in food preparation, food preservation and clothing during each of her seven years; won the Michigan Farmer magazine award in 1950; was editor of her high school's annual, active in her church, and a member of the county 4-H service club. To round out her 4-H program she carried a dairy project for three years and one year fed out a baby beef. Following the 1951 show she enrolled in Michigan State college.

Parents, relatives and friends who visit the show, join the boys and girls in the evening on the grassy slope in front of the band shell to hear county 4-H bands play. Then they move across the street to the auditorium for the evening program. There are no long, dry speeches. Dr. John Hannah, president of the college, welcomes them to the campus, awards are made and there are such features as the popular dress revue. Plenty of top-notch entertainment is offered.

Until last fall all the entertainment had been provided by professionals from Detroit or Chicago, financed by such organizations as the Sears-Roebuck foundation. In 1951 the top 10 acts from the home talent competition provided the entertainment for

the Thursday night program. The enthusiastic approval of the audience made certain that this will be an annual feature of the show.

It was the first year for the home talent competition. Arden Peterson, assistant state leader in charge of recreation, saw the possibilities of an organized program to draw out these talented performers. A contest was organized in which 45 counties held "Home Talent Fun Festivals" for the enjoyment of folks in their locality and to pick top acts for the state show. Regional contest pared the entry list down to 20. These 20, though billed as amateurs, were entertainers of professional ability.

The crowd thundered its approval and begged for encores when Virginia Leech, from Cass county, gave a demonstration of baton twirling that won first place and a trip to Chicago to perform at the 4-H congress. Applause for the other acts was hardly less deafening. The presentations ran the range from Newaygo county's barbershop quartet in top hats and tails through the "Highland Fling" dance team from Calhoun county, to intricate ballet by Mary Estes of Macomb county and a classical piano solo by Kathryn Summers of Clinton county.

Once again the 4-H'ers proved that, given a chance, they can put on their own show—and do it better.

The importance of tractor power in modern farming is recognized in the plowing contest and the tractor operator's contest, both recent additions to the state show. Last year was the fourth for the plowing contest. Some 20 boys, champions in their county contests, competed. Safety and skill in plowmanship are the important factors. Speed is secondary. Charles Bishop of Lenawee county took home the honors.

At the tractor operator's contest seasoned farmers nodded their approval as the boys whipped tractor and trailer back and forth through a row of barrels. Their eyes opened wider as the boys backed the tractor and trailer through the barrel row almost as quickly.

The 4-H show came to the campus in East Lansing in 1942 when the state fair in Detroit was closed during the war. Removed from its necessarily limited quarters and competition of many activities at the fair it flourished and came into full bloom. At war's end there was no thought of moving it back. In the 10 years the show has been on the campus it has more than tripled in size.

Though it is a "fair without fanfare" Michiganders agree that it's the best thing that ever came along for their farm youth.

Cascade Lotus, Promising New Legume

Condensed From Soil Conservation

R. B. Branstead

DAIRY farmers along the west coast of Oregon and Washington got an answer this year to one of their most vexing problems: What to do with land that is too wet, too dry, too shallow, or too acid for alfalfa or clover. The answer is Cascade Lotus, a new variety of broad leafed birdsfoot trefoil developed jointly by Soil Conservation Service nursery scientists and the Washington State college agricultural experiment station.

The announcement that limited supplies of Cascade Lotus seed would be on the market in 1952 climaxed nearly 15 years of searching, selecting and testing by A. L. Hafenrichter, W. E. Chapin and A. G. Law.

These three men realized many years ago that a different legume, such as trefoil, was vitally needed for use on soils that would not support good stands of alfalfa or clover. There are extensive areas of such soils along the Oregon-Washington coast. Numerous farmers in years past had experimented with the common, narrow leafed varieties of birdsfoot trefoil, but with generally poor results. The greatest difficulty seemed to be in getting a stand. The trefoils then on the market were extremely weak in the seedling stage and offered little, if any, competition to weeds. Stands were extremely difficult to establish and seldom stayed in long when competition developed from other plants.

Hafenrichter, Law and Chapin began hunting for a more vigorous strain of birdsfoot trefoil in 1938. They were confident that if a strain could be found that would show more "fight" farmers would welcome it.

They collected seed from all available strains and began a lengthy testing and selection program at the soil conservation nursery at Bellingham. The collection included many kinds of birdsfoot trefoil (Lotus corniculatus). As the tests went on, they discovered that three lots of an introduction from Italy with the unromantic title of FC 20,153 appeared to have the qualities

Reprinted from Soil Conservation
Washington, D. C.

they were after. These three lots produced as much forage on a five year average as the best varieties of alfalfa.

Interest centered on some outstanding plants of FC 20,153. As superior plants were selected, they were moved to an isolated spot where they could not be contaminated by weaker strains. Here they were allowed to cross-pollinate and produce seed.

This seed was grown in three places in western Washington; Bellingham, Puyallup and Vancouver, in a scientific test with other leading strains of Lotus. The Italian Lotus out performed them all.

When enough seed was available, field trials were made throughout western Washington for three successive years to see if the plant would live up to its expectations on the farm. Results were impressive. The cross from selected plants was named Cascade Lotus and accepted and released to selected growers by the Washington State Crop Improvement Association in 1949.

Cascade Lotus is superior to other strains of trefoil in many ways that will be welcomed by farmers who have struggled to grow the common varieties in the past. The seedlings are more vigorous. They give far better competition to weeds and grasses and are able to hold their own nicely in a mixed stand. Cascade Lotus produces especially well when grown in alternate rows with orchardgrass. At Bellingham it yielded 2.31 tons per acre when grown with grass. There is more recovery after the first hay cutting and more summer grazing on nonirrigated pastures.

Although Cascade Lotus can be used on the poorer and more acid soils where other legumes will not thrive, still there is a limit to where it will grow. It cannot survive in swamplands or on peat, nor will it grow on soils that are extremely droughty. It can stand occasional flooding, but prolonged immersion for several weeks will kill it. It has not yet been proved winter hardy east of the Cascade range in Washington and Oregon.

The biggest drawback to birdsfoot trefoil in the past has been the difficulty of establishing a stand. Cascade is much more dependable in this respect. It needs a firm seedbed, as weed free as possible, that has been well packed to bring the moisture up to the seed. Seeds are planted not over half an inch deep. Rolling the seedbed after seeding frequently proved the difference during tests between success and failure in getting a stand started.

Recommendations of the Bellingham nursery are to use four pounds of Cascade Lotus with four pounds of orchardgrass or six pounds of Alta fescue per acre.

Cascade must be inoculated with the right bacterial culture for the *Lotus corniculatus* family.

Fertilizing with superphosphate at 150 to 200 pounds per acre usually pays. Where soils are badly run down, a faster and better seeding can be established by using 100 pounds of ammonium nitrate or 150 pounds of ammonium sulfate per acre at seeding time.

The tender leafed, yellow flowered Lotus has excellent forage qualities. It is readily eaten and liked by all kinds of livestock and has a feed value close to alfalfa. It is highly nutritious as hay or silage in a grass mixture. Also, it is considered by many livestock men to have less tendency to bloat than other legumes. Lotus also has a favorable effect on the keeping qualities and vitamin A content of milk.

Although Cascade Lotus yields more than other strains of Lotus, it will not yield as much as alfalfa on deep, fertile, well drained soils. Nor will it yield with Ladino on the better irrigated soils of the coastal area. But where these stand-by legumes cannot make the grade, Cascade Lotus looks like a highly practical and profitable substitute.

Soil Acidity Means Reduced Crop Yields, states L. E. Willoughby, Kansas State college, Manhattan. In tests over a 24 year period, value of using lime on acid soil was shown. For every dollar spent for lime, approximately 10 dollars was returned through increased crop yields.

Annual yield of alfalfa increased 1.17 tons per acre, corn 10.4 bushels per acre, flax 3.4 bushels per acre, oats 9.7 bushels per acre, wheat 6.6 bushels per acre, and soybeans 1.9 bushels per acre.

The acid content of soil is measured by the pH value. A pH value of four is extremely acid. Acidity decreases until a pH of seven is neutral. A soil test showing a pH reading over seven shows the presence of too much soluble minerals for the growth of most crops.

Result of experiments in Ohio show that corn on an acid soil, pH 4.7, produced only 14.3 bushels per acre, on soil with pH five the yield was 30 bushels, on soil with pH 5.7 the yield was 35.3 bushels. The highest yield, 40.9 bushels per acre, was produced on soil with a pH of 6.8. The yield was reduced to 34.9 bushels on soil with a pH of 7.5. The best soil is slightly acid. Too much acid or too much minerals reduces yields. *Kansas Extension Service*

Heat-Pump Principle Preheats Water With Same Refrigerating Machine That Cools Milk

Bossy's Body Heat Warms Wash Water to 120 Degrees

Condensed From Agricultural Engineering

L. F. Charity, V. H. Baker and U. F. Earp

Virginia Polytechnic Institute

ELECTRICITY has two main jobs in a modern milkhouse. First is to cool the milk, received from the milking machines at about 90 degrees Fahrenheit, down to 40 degrees. Second is to heat water for washing, rinsing and sterilizing the various utensils, requiring a temperature raise from around 60 degrees to about 160 degrees. If all the heat taken out of the milk at the lower temperatures could be put into the water at the higher temperatures, it would do about 30 per cent of the water heating job. But it's something of a trick to make heat "run uphill."

How it was done with a saving of not just the theoretical 30 per cent but an actual 55 per cent of the water heating electricity is told in a paper presented at the winter meeting of the American Society of Agricultural Engineers last December at Chicago.

The study was conducted in a typical milkhouse layout for four cans (40 gallons) of milk every 24 hours, and a hot water usage of 68 gallons. Ordinarily the hot gas from the refrigerating compressor goes through an air cooled condenser. This takes the heat out of the milk and puts it into the milkhouse air, which sometimes is undesired. In this project the agricultural engineers put condensing coils inside an insulated tank supplied with tap water.

While working as a water cooled condenser, it also served as a preheater for the main water heater. Since it was not desired to work the refrigerating machine at a condensing temperature higher than 120 degrees, an auto-

Reprinted by permission from Agricultural Engineering
St. Joseph, Michigan

matic valve was provided to "bleed off" water when that temperature was reached. The effect was to feed the main water heater with water warmed to 120 degrees, or close to it, instead of tap water at about 60 degrees.

It worked so well, under the conditions of usage, that the upper 1,500 watt unit in the heater never needed to cut in. The lower 1,000 watt unit did the job alone, and with 55 per cent less "juice" than was needed before the preheater was connected. There was no significant difference in the performance or current consumption of the refrigerating machine. There was less warming of the air in the milkhouse.

Obviously, the 55 per cent of heat recaptured included considerably more than the 30 per cent derived from the milk. Some of it came from friction and other losses, and from the heat of the electric motor. But it all was clear gain, over eight kilowatt hours per day, or perhaps $75 a year, depending on rate.

As a possible guide to further development, the engineers ran a series of tests on the water heater with varying degrees of preheat. At 95 degrees preheat the saving was only about 30 per cent. From this it ranged consistently up to about 70 per cent when the water was preheated to 135 degrees. Whether it will pay to build compressors and provide power to operate at higher condensing temperatures, that is the further question for the engineers.

DON'T GO OUT OF THE SHEEP BUSINESS because of the drought. Sheep can be depended on to make money. Even during the leanest of depression years sheep were profitable, according to Richard C. Miller, University of Kentucky.

Don't sell off breeding ewes with the idea of replacing them next year, Miller said. Better types of western ewes are not likely to be available. A breeding ewe will pay for feed several times over, Miller noted. In a normal winter, Kentucky sheepmen feed less than a ton of hay for every eight ewes, and only about a bushel of grain a ewe. Total cost, if all the feed were bought, should be only about a fourth what the ewe would return in sales of lambs and wool. Instead of selling good breeding flocks at this time, it would seem a better plan to make replacements and buy additional feed that may be needed, the Kentucky stockman declared.

12 Poultry Practices That Pay

Condensed From Poultry Tribune

S. R. Winters

University of Missouri

POINTING the way to more profits from poultry are the "star flocks" in the Missouri Farm Flock Improvement Project. Comparing them with the average Missouri flock, here's how they stack up.

Fall rate-of-lay is more than twice the average. Flock size is three to four times greater. They lay five dozen more eggs per hen annually, and the flock income above feed cost is seven to eight times greater.

Before I go further, let me briefly tell you how these flocks got the name of "star flocks." Five such flocks are selected each year from among Missouri's record flocks. Egg production, marketing methods, adequacy of housing and equipment, income and a few other practices are included in selecting these flocks. The project is conducted through the co-operative efforts of the Missouri Agriculture Extension Service, the Kansas City Chamber of Commerce, and the Weekly Kansas City Star.

The program has been operating for nine years. An average of the period shows that the annual income above feed cost has been $1,324 per flock. Flock size has averaged 306 layers; the hens have laid at a rate of 218 eggs per bird annually; and the fall rate-of-lay has been 57 per cent. These figures are on the basis of the average number of layers in the flocks through the year.

During the nine years there has been a rather steady improvement in production secured — with a production of 238 eggs per hen this past year and an average rate-of-lay of 70 per cent for October, November and December.

The seven to eight times greater flock return above feed cost in these flocks of star poultry raisers is due to four factors. They are: High annual production per hen, good rate of fall lay, better marketing and larger flock size. But there are a dozen important practices back of these four points.

Buy Quality Chicks

These producers don't spend much time shopping around for a new breed to solve their problems. They stick pretty much

Reprinted by permission from the Poultry Tribune, Mount Morris, Illinois, April, 1952

with the popular breeds and varieties, but they do look into the records back of the strains of chicks they buy.

It takes a little more money to buy production bred chicks, but it comes back many fold. The annual egg production in these flocks is 218 eggs per hen. This is 61 eggs more than the average Missouri flock, which is 157 eggs per layer. The average for the United States is about the same as the Missouri figure.

Start Chicks Early

Chicks are given an early start. Most of them are a February or a March hatch, with a few in January, and a very few are started the early part of April.

Keep an All-Pullet Flock

These producers depend largely on young layers. In most cases, enough chicks are started to replace the entire flock each year. Higher annual production and better rate-of-lay during the fall and early winter are advantages of the all-pullet flock.

Make Use of Lights

Lights are another tool used by most of these flockowners to give them better control over the performance of their flock. Lights help to stimulate top fall production and help to avoid fall slumps in the pullet flock. Also, lights are used by some to stretch out the laying year.

These four points all contribute directly to the rate-of-lay during the fall months when the egg price swings up to its high point for the year.

During the past 25 years in Missouri, the price of eggs in the last three months of the year has averaged 6c more than the average yearly price. These star poultry raisers have taken advantage of this better seasonal market by securing a 57 per cent rate-of-lay during the fall months. The rate-of-lay in the average Missouri flock has been 26 per cent during the fall months for the same period of years.

Provide Comfortable Housing

The comfort of the birds is another item which receives the attention of these flockowners. The chicks start their life in adequately heated brooder houses.

Houses of the star flockowners range all the way from new ones to old ones that have been remodeled adequately. Hens are generally allowed three to four square feet of floor space per bird; a 9x12 foot range shelter houses 125 to 150 pullets to maturity; and 100 chicks are allowed at least 40 to 50 square feet of space.

Allow Plenty of Feeder Space

Star flockowners provide plenty of feeder space. After the chicks are two and a half to three weeks old, most of these producers provide about three broiler-size feeders three feet or longer for every 100 birds. On range, feeder

space usually consists of three five foot range type feeders per shelter. In the laying houses, two or more five foot feeders are used per 100 hens for mash, plus others for grain, depending upon the feeding system used.

Feed Balanced Ration

Liberal feeding of nutritious, palatable feed helps get maximum growth and production. A starter mash is used for the first eight weeks, with grower mash and grain fed on the range. Various feeding programs are used in the laying houses. The most conventional one is a mash of about 20 per cent protein kept constantly before the birds, with the grain fed by hand.

Protect Flock Health

These star poultry raisers start with good chicks. Good nutrition also helps. Most chicks are brooded in confinement for the first eight weeks, with shelters used as sun porches. Usually the brooding operation is away from the laying flock. A good many vaccinate for fowl pox. If Newcastle is a problem, intranasal vaccine, g i v e n when the chicks are a day old and followed by wing-web vaccination when on range, seems to work quite well. Pullets spend the summer on clean range. While these flockowners like to have their neighbors take a look at their layers, they let them do their looking from the outside of the house.

Cull the Loafers

If hens quit laying, it is a certain invitation for a trip to town. Culling is done continuously to keep out the loafers.

Locate a Good Market

These flockowners go after the extra nickels in marketing. This involves first, a good product. Whether producing hatching or table eggs, frequent gathering of eggs, adequate nests, clean nesting material, cool holding conditions and at least once-a-week marketing help provide the product desired.

The majority of the star poultry raisers have a better market than current receipt. Graded outlets, private customers and hatchery markets are the more common markets used.

Get More Eggs From Best Layers

Several of these flockowners are stretching the laying year. When it comes time to move in the new pullet flock, the best of the old birds are moved to a brooder house, an empty shed or an unused driveway through the barn. Lights are turned on, and the birds are kept in production for a n o t h e r two, three or four months. In this way, a layer produces through two high priced seasons and one low one.

Keep a Large Flock

The first 10 points above contribute primarily toward getting satisfactory r e t u r n s per hen. Number 11 adds to the volume of

production during the fall months. But to make poultry profitable, it takes volume. These "star flocks" are three to four times larger than the average Missouri flock.

To make these "star flocks" practical and to get a satisfactory labor return per hour, it takes labor saving methods. Labor savers that are quite common on the farms of the star poultry raisers include automatic waterers in the laying and brooding quarters, feed rooms in the laying and brooder houses, and feed storage on range. The trend is toward wider and deeper houses and larger pens.

PRACTICES USED IN "STAR FLOCKS"

1. **Buy Quality Chicks**
2. **Start Chicks Early**
3. **Keep All-Pullet Flock**
4. **Make Use of Lights**
5. **Provide Comfortable Housing**
6. **Allow Plenty of Feeder Space**
7. **Feed Balanced Rations**
8. **Protect Flock Health**
9. **Cull the Loafers**
10. **Locate a Good Market**
11. **Get More Eggs From Best Layers**
12. **Keep a Large Flock**

SPECIALLY PROCESSED COTTONSEED — Southern pigs might well be fed on southern grown cottonseed meal, if it were specially processed.

In fact, research at Arkansas Agricultural Experiment Station has shown that when a screw pressed cottonseed meal is supplemented with six per cent of fish meal, the resulting protein supplement is nearly as adequate for growing and fattening pigs as one composed entirely of fish meal.

However, Professor E. L. Stephenson cautions that regular commercial hydraulic or solvent-processed cottonseed meal should not be fed to pigs. It is extremely toxic, he states. All pigs receiving such solvent or hydraulic cottonseed meal fed as 43 per cent of the experimental ration died before the end of the study, and those receiving hydraulic-processed cottonseed meal at the 20.5 per cent level died soon after the study was over. The screw-pressed cottonseed meal used in the research was prepared experimentally by the Southern Regional Research Laboratory. *University of Arkansas*

The estimated quantity of farm products marketed during the second quarter of 1952 is about six per cent above that marketed in the second quarter of 1951.

Will Feeder Cattle Pay in '53

Condensed From Michigan Farm Economics

Bob Kramer

FEEDING cattle during the next year is expected to be profitable. Slaughter cattle prices will be lower, but so will feeder cattle prices.

There are several factors which tend to encourage cattle feeding this year. Some of the more important ones are:

1. Lower feeder cattle prices.
2. Less pork in 1952-'53 than in 1951-'52.
3. Larger government expenditures for defense.
4. Continued high take home pay.
5. Strong demand for beef.

Some of the important factors which tend to discourage cattle feeding this year are:

1. The record beef cattle population in the United States.
2. The larger supply of beef in 1952-'53 as compared with 1951-'52.
3. Higher production costs.
4. Lower slaughter cattle prices compared with feed prices.
5. Lower hide and tallow prices.

On balance it appears that the encouraging factors outweigh the discouraging factors. Profits are possible again this next year by putting on economical weight gains and from positive price margins (selling price higher than purchasing price).

Demand for Beef to Stay Strong

During the next year the United States will continue to have large defense expenditures. The production of defense goods, as well as domestic or civilian goods, will mean full employment and high incomes. High take home pay will mean a continued strong demand for beef. This strong demand for beef will help to hold cattle prices up.

Reduced hog supplies will also tend to push cattle prices up. The 1952 spring pig crop of 56 million head was nine per cent less than the 62 million head saved in 1951. Farmers have indicated that they plan to reduce fall farrowing also by about nine per cent. The smaller spring pig crop will mean fewer hogs will be marketed this fall and winter. If farmers' intentions for fall farrowing are carried out, there will be fewer hogs marketed in the first half of 1953.

Supply of Beef Will Be Larger

When we shift to the supply side of the cattle picture, however, we see factors which will tend to push slaughter cattle prices down. The total number of cattle and calves on farms and ranches at the beginning of 1952 was more than seven per cent greater than a year earlier and the largest on record. (Table 1.) Cattle numbers are expected to continue expanding. The point has now been reached where marketing of cattle for slaughter can be increased, while at the same time permitting a further gain in cattle numbers.

The increased cattle population will probably mean lower slaughter cattle prices and also lower feeder cattle prices. However, don't forget that we need more cattle each year because we are adding between two and three million beef eaters each year. So, don't expect the larger cattle numbers to bring depression prices.

In 1951 the average person in the United States ate 138 pounds of meat—56 pounds of beef; 72 pounds of pork; 6.5 pounds of veal, and 3.5 pounds of lamb and mutton. In 1952 each person will eat 140 pounds of meat. There will be four pounds more beef per person; one-half pound more veal; one-half pound more lamb and mutton, but three pounds less pork. The decrease in pork supplies will remove some of the downward pressure from beef prices.

Cost Up—By-Product Prices Down

Despite the decline in the market for slaughter cattle, caused by the increased supply of cattle, most farm production costs will continue at high levels. Farm labor will not become any more plentiful or lower priced.

Feed costs will depend on the 1952 production. The prospects are for a near record production of feed grains and roughages. Grain and roughage prices will be lower at harvest, but will average about the same this next year as last year. Commercial feed prices will probably stay high because of higher labor costs and higher freight rates.

Hide and tallow prices have dropped drastically in the past year. Hide prices have dropped by two-thirds and tallow prices have dropped by one-half. The drop in the prices of these two by-products has caused live cattle prices to fall between one and two dollars per hundred.

Boiling It Down

Replacement cattle prices are at least five dollars lower than last year and probably reached their low point for the year in July. They have gone up since then, but should work some lower in October and November.

If you plan to buy feeder cattle this fall and now have pasture,

buy your cattle now. They might be a little lower priced later on, but your cattle will have become acclimated and the gains they will have put on between now and October will have cheapened them in line with the October market price.

As always, good quality beef calves or good quality light feeders are less speculative. Cheap gains can be put on these cattle and they provide great flexibility. There are many different ways that calves and light feeders can be fed out. The method selected should depend upon the weight and quality of the cattle and upon the amount and type of roughage and grain available. These factors should be considered in any feeding programs.

Examine your feed supply and build your cattle feeding program around it. You can make money this next year feeding cattle.

TABLE 1—Cattle Numbers in the United States, January 1, 1943-1952

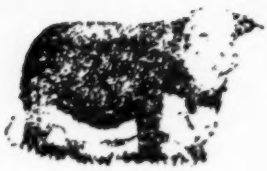
YEARS	DAIRY CATTLE		BEEF CATTLE				TOTAL
	Cows over 2 years	All others	Cows over 2 years	Heifers 1-2 years	Steers over 1 yr.	Calves & bulls	
	(Thousands)						
1943	27,138	13,102	13,980	4,547	7,361	15,076	81,204
1944	27,704	13,553	15,531	4,971	7,849	15,736	85,334
1945	27,770	13,079	16,456	5,069	8,329	14,870	85,573
1946	26,695	12,398	16,319	4,854	7,715	14,453	82,434
1947	26,098	12,370	16,469	4,664	7,164	14,442	81,207
1948	25,039	12,136	16,000	4,541	6,743	13,667	78,126
1949	24,416	12,112	15,982	4,689	7,395	13,704	78,298
1950	23,853	11,602	16,743	4,754	6,805	14,206	77,963
1951	23,722	11,844	18,396	5,082	6,987	15,954	82,025
1952	23,407	12,463	20,608	5,890	8,373	17,321	88,062

DHIA Testing Pays Big Dividends — Would you trade a one dollar bill forfor a "ten spot?"

If you have at least 20 cows in your dairy herd, join a dairy herd improvement association and use the DHIA records to improve production year after year, you may be able to swing a deal very much like that, says L. R. Fryman, dairy specialist at the Illinois College of Agriculture.

At least eight dairymen in one Illinois county made such a "trade" after about 10 years of DHIA testing. Here is how the figures show up in records of those eight herds, which averaged 22 cows: In 1951 those dairymen showed an average return above feed cost for each herd of $1,078 more than if the herds had continued to produce at the same level as before testing was started. And it costs less than $100 a year to test a herd in Madison county. The eight herds averaged 59 more pounds of butterfat a cow last year than they did the year testing was started.

How We Make Beef for 14 Cents



Condensed From Farm Journal

Howard Long

LAST year we produced 180,000 pounds of beef here on Long Ranch in Indiana at a feed cost of about 14 cents a pound.

It was good beef, too. At least we got 35½ cents last October when we sold the bulk of the steers.

How was it done? Well, we do some radical things (so we've been told). We only have about 160 growing days — and expect out pastures to carry cattle for eight months out of the year, and to furnish *part* of the feed for another two months.

We crowd our pasture season at both ends—run cattle in stalk fields (with a little hay to boot) in midwinter, and feed corn cobs when there's no field browsing.

Here's what we did last year: We got 616 calves from Montana in November. They averaged 419 pounds—were mixed lots of steers and heifers.

As soon as they rested up from shipping, they were all put on good grass-legume pasture. Then we started *sorting out* according to size as they went along into the winter.

There were over 100 little ones —weighed less than 300 pounds. We pulled them out first (in December), and put them on corn silage and a couple of pounds of ground oats and corn. They also got grass until the snow covered it—then a little carry-over hay.

That left about 516 in the original bunch, so we went back to them about Christmas time to do some more sorting.

We cut out the thinnest of the bigger calves and started them on ground corn cobs, a protein-molasses supplement (similar to the Purdue Supplement "A") and added some chopped hay.

That left about 400 head in the original bunch—and they stayed on pasture until mid-January with no other feed. Then the grass began to play out, so we started giving them cobs and supplement.

On the first of May we put 500 of the bigger calves together again — on new spring pasture. They took 40 acres of our best pasture in a week. But figuring a gain of two pounds a day, they paid 7,000 pounds "rent" that

Reprinted by permission from The Farm Journal, Philadelphia, Pennsylvania

week.

Then they went on an 80 acre field and ate that one down in two weeks. The grass was tender and they ate it down from the tops—looked like a mower was clipping it a little closer each day.

We moved them off this pasture when they had it close, and gave it a six weeks' rest.

We did some more sorting—pulled out the largest heifers in late June and put them in a separate pasture. Then we dragged in self-feeders, filled them with grain and supplement, and started finishing out that bunch. Looked like we'd be running short on corn, but barley was a good buy so we used that, and added 28 pounds of ground corn cobs to each bushel of ground barley. We also fed a protein-molasses supplement—starting at a pound a day and boosting it a pound each month until we were up to three pounds a day.

Two weeks later, we pulled out another bunch (the larger steers) from the original group and put them on the same feeding schedule, rotating the pastures during this feeding period. After that, each group went into dry lot for 10 days of full feed before they were sold.

We sold all but about 100 of the small ones—kept them back and carried them through the next winter on less than 30 days supplemental feeding of any kind.

They gained about 150 pounds for the winter—came through in good shape and were in about the right flesh to put on spring grass for maximum grass gains. (I haven't figured down to the penny, but wintering costs on this lot run less than $6 a head.)

Roughly, that's the way we do it. But I'd like to say a little more about pastures, silage and cobs.

We count pretty heavily on good pastures. If they aren't good, the system breaks down. A mixture of alfalfa, ladino clover, brome grass, timothy and alta fescue, with plenty of fertilizer to get them started, works fine.

Our pastures are usually okay until snow covers them. We'd like to hold our winter feeding period down to 60 days. That'll take a little "doing" here in Indiana, but maybe we can produce grass that will stand in the snow. And maybe a few more acres of rye pasture will give us better late fall and early spring grazing.

We've gotten away from hay and silage pretty much. One reason is that the job of putting them up conflicted with other work on the farm. The other reason is that maybe we can increase the livestock capacity of the farm by using the grass for grazing and getting our stored roughage from other places.

And about corn cobs — the calves eat all the cobs they want —it's never been more than 12

pounds a day.

They get supplement, mainly a soybean oil meal - dry molasses mix, at the rate of three pounds a day. It has cost us from $80 to $105 a ton.

There's nothing fancy about our cob handling set - up. We dump the cobs out-of-doors, and they get wet and mouldy, but the calves don't seem to mind that. A 14 - inch hammermill grinds them up, and does it easier when they're frozen.

The Chance Is Too Great — Every once in a while breeders are shocked to learn of the death of some valued member of the fraternity who was killed by the herd bull. C—— L—— of M——, Iowa, who was recently killed by just such a bull, along with countless others, would want a warning sounded that there is no such thing as a "gentle bull." Not long ago, he told some friends that his bull was as gentle as a lamb, and for his trust in this belief he paid with his life. It is not the known ugly bull, or the known loaded gun that kills people, because they are handled carefully. It is that unsuspected gentle bull, that gun we think is not loaded, that destroys. Why is it that throughout America you will find the majority of farmers taking chances with their sire? Why is it that we do not realize that in a flash that bull can dispatch us to an untimely death? If you value your life, remember, there is no such thing as a bull that is always gentle. *Guernsey Breeder's Journal, 1945*

Cover Crops Check Splash Erosion — "An inch of rain falling on an acre of land contains enough energy to plow that acre 10 times, or the equivalent of some 100 horsepower." That fact, measured by the United States Navy Department, should be enough to scare most farmers into keeping their soil covered with a good legume or grass. Cover crops check this splash erosion which is common to most types of soils. Splash erosion causes losses in soil and fertility, damages soil structure, and can actually injure plants and animals. In certain sections of Tennessee, cattle are believed to have been poisoned by grazing on plants which had been splashed with soils containing flourine.

To check such erosion, and to improve soil fertility and soil structure, the extension service recommends growing adapted varieties of cover crops. You won't get startling results in one year, but cover crops plowed under can build up a soil that produces 40 bushels of corn per acre, to one that consistently produces 90 bushels or higher.

Delaware Extension Service

Planning for Greater Dairy Profits

Condensed From Michigan Farm Economics

Darwin G. Kettering

THE dairy farmer, like any businessman, wants his business to pay off in higher profits. From dairy cost records kept by farmers in the Detroit milkshed during 1951 it is evident that many dairymen are able to achieve efficient and profitable milk production. The study showed that some dairymen had costs 17 per cent below the average of the whole group. At the other end there were men who had costs 34 per cent above the group average. The range from the low cost herds to the high cost herds was from $3.56 to $5.75 per hundredweight of milk produced. The important point is that lower costs are possible. Now what can the less efficient dairymen do in planning and managing their dairy enterprise to lower their costs in producing milk?

Planning Bossie's Menu

When planning the dairy enterprise the dairyman should first consider his feeding practices. Feed is the largest item of expense in the production of milk. The level of feeding can be easily changed. Available evidence indicates that good quality roughage should be fed liberally in order to lower feed costs. Grain is required to balance the cow's ration and increase the supply of nutrients. The most profitable level of grain feeding is determined by: (1) the relationship between the price of milk and the grain ration cost, and (2) the inherent capacity of the cow to produce.

According to the records, the herds that had an average milk production per cow of less than 7,500 pounds produced the highest return over feed costs when fed grain at a rate of one pound for every five pounds of milk (table 1). The average return over feed cost per cow was $220. The medium production level herds produced the highest return over feed cost at a rate of one pound of grain for every four pounds of milk. At the highest production level the greatest return was obtained at a rate of one pound of grain to three pounds of milk.

TABLE 1—The effect of various grain feeding rates on returns over feed cost at three production levels*.

Grain Feed Rate	Milk Production Level		
	Less Than 7500	7500-9500	9500 & Over
One pound grain to	Return over feed cost per cow:		
2 lbs. milk	$150	$223	$298
3 lbs. milk	179	225	341
4 lbs. milk	209	267	324
5 lbs. milk	220	256	310

* 75 Annual herd records, Detroit milkshed, 1951

These returns over feed cost were obtained at a time when the price of milk was favorable when compared to the cost of feed. The average price received for milk was $4.58 per hundredweight and the grain ration cost $2.89 per hundredweight. Milk-feed price relationships are considered favorable when 100 pounds of milk will buy 150 pounds or more of grain ration. Under less favorable price relationships these dairymen would have found the most profitable level of grain feeding to be at lower rates; the lower producing cows receiving 1:7 (one pound of grain to seven pounds of milk), the medium producers 1:6, and the high producers 1:4.

The second item the dairyman should consider is labor. It is the second largest item of expense in producing milk, and cost records indicate that many farmers are not using it efficiently. There is wide variation in the time spent by individual dairymen in the care of their cows. The hours of labor per cow a year ranged from 70 to over 200. While old bossy may enjoy the attention, extra time means added cost. However, a reduction in the labor requirements per cow does not necessarily mean that the dairyman will receive any actual increase in income. A reduction in the hours spent per cow can increase the dairyman's income in two ways: (1) it can reduce the hired labor expense, or (2) it may allow the dairyman to increase the size of his herd or the other productive enterprises on the farm.

Ways to Save Labor

In order to find ways to lighten the work load and thereby save labor the dairyman needs to do three things. First, the barn layout should be checked for possible changes that would save steps. Second, the work methods should be analyzed to eliminate waste motion and unnecessary trips. Third, he should check for the possible use of labor saving equipment. With the cost of farm labor at a high level it is important that needless chore operations be eliminated. Careful planning of chore operations and efficient use of equipment has reduced the labor needed per cow on many farms and it is possible to do the same on many more.

Planning for the Years Ahead

We have now considered the two largest cost items and what the dairyman can do to reduce

these costs. However, if milk is to be produced at a very low cost it requires the production of a large volume of milk. This means a large herd and high milk production per cow. The dairyman should consider increasing the size of his herd until he has a minimum of 20 to 25 cows per man. These cows should produce at least 300 pounds of butterfat. How well the dairyman succeeds in increasing production per cow will depend on: (1) using proven sires, (2) selecting cows with a high inherited production capacity, (3) feeding high quality roughage, and (4) having cows freshening regularly every 12 months. Producing a large volume of milk is the only way efficient use can be made of buildings, equipment and labor to obtain the lowest possible costs.

Farming Is a Business

Agriculture is gradually assuming the characteristics of a commercial business. As it becomes more mechanized and scientific, cash operating costs rise relative to net incomes. Dr. E. L. Butz, Purdue university, points out that in 1950 the cash production expenses per farm in the United States were 157 per cent of the net income per farm. In comparison, in 1935-'39 the cash production expenses were 124 per cent of net income, while in 1910-'14 they were only 103 per cent of net income. This tends to place farmers with low efficiency in a more vulnerable position than formerly if we should enter a period of declining prices and income.

A high level of ability to manage is required to run the modern commercial family farm. The modern farmer must be a laborer, capitalist, manager, chemist, geneticist, agronomist, husbandman, biologist, entomologist, engineer, economist and lawyer. It takes all of these abilities for a successful 1952 farm manager, Dr. Butz says.

He adds that agricultural workers have become a constantly declining proportion of the population. Farm population reached a peak of 32 million in 1916, a third of the total population. The number has dropped to 23 million at the present time and is less than 16 per cent of total population.

Likewise, farm employment has shrunk about one and one-fourth million workers in just the past five years. The Purdue man says that "we must continue to move people out of agriculture. The release of people from the farms to work in the cities means that we all get fed with fewer farm people doing the job, and more people available to manufacture the things that make a high standard of American living."

BIGGEST CROSS-ROADS BANK

How a Country Bank Thrives on Cattle Loans Competitors Don't Want

Condensed From The Wall Street Journal

Richard B. Cole

"THE biggest cross-roads bank in the country." That's what the people in Danville, Vermont call the Caledonia National bank. The slogan is open to challenge, of course, but few localities so small have any bank, much less one with 6.2 million dollar assets.

Danville has a general store, some filling stations and fewer than a hundred homes. There are just two brick buildings on the main street, a school and the white pillared home of the Caledonia bank.

Shotguns for Defense, Hunting

But operating amid this quiet background, Caledonia National has put on its books a volume of loans nearly as great as the total of the three commercial banks in St. Johnsbury, trading center for north central Vermont and New Hampshire, nine miles away. It is running neck and neck with the largest savings bank in Vermont's five northeastern counties.

Even back in 1934, when a third of its present size, the Caledonia was important enough to claim the attention of Eddie Bentz, then rated high up on the Federal Bureau of Investigation's list of "public enemies." Bentz and two associates held up the bank, getting $18,000 in cash and negotiable bonds. The amount was recovered through insurance, and Bentz was taken out of circulation for 15 years. Now two shotguns are stacked in a back corner of the bank to repel any similar invasion—and for use by employes during the hunting season.

Why has this country bank grown so big? Caledonia's directors and competitors, together with bankers to the south in Boston, come up with the same answer: Asa Wesson.

Mr. Wesson is a soft-spoken man who has spent a lifetime building Caledonia National to its present size. He joined the bank

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in 1898 and became cashier—the active operating man—in 1900, when its deposits were $40,000. Now deposits top $5,500,000.

Doesn't Fear Paperwork

"We specialize in making cow loans and discounting notes given by farmers to cattle dealers. Vermont farming is mostly dairying and we've grown up a dairyman's bank with an understanding of farmers' problems. We give a lot of service on cattle loans, which require so much paper work most banks won't handle them, and right now we're being offered more business than we can handle." That's the way Mr. Wesson understates his bank's operations.

Others who know him best talk more freely about his second sense of values, which helped the bank grow.

"He knows a cow from horns to tail like no other New England banker," said one of his Boston correspondents. "He's the smartest as well as the most agreeable competitor we have," was the word from Arthur Parker, assistant manager of a farmers' short term credit co-operative.

"Mr. Wesson and his directors are a bunch of very shrewd Yankees," agreed Harry Zabarsky, president of St. Johnsbury Trucking Co., one of New England's biggest truckers with a 400 car fleet. Mr. Zabarsky obtained some of his earliest credit from Caledonia National after he started hauling milk with one truck in 1920, and he still keeps pay roll and checking accounts at the bank.

Mr. Wesson has kept the bank's losses down to 0.26 per cent of loans over the past 20 years. Caledonia put no borrower out of business by foreclosing on his loan during the depression of the early 1930's. It was the second Vermont bank to reopen after bank holiday of 1933.

Uses No Gimmicks

The bank uses no stunts or gimmicks, or even aggressive salesmanship, to swell its loans. It doesn't need to; the business just flows in.

It is favoring a conservative lending policy at this time. "We're discouraging more loans than usual because our directors are afraid cattle prices are too high at twice the 1940 level, and we don't want our borrowers over-extended," said Mr. Wesson.

Also operating in the state with the country's highest proportion of bank assets out on risk, Caledonia is lending 55 per cent of its deposits. Bank examiners think the figure should be held down to 50 per cent, a viewpoint which irks some of the directors.

"Our loss ratio is low but if you don't have some losses you aren't making all the loans you should," said Howard G. Shonyo, cattle dealer who is president of the bank. "It's just as bad to

turn down a good loan as it is to make a bad one," it is felt by director K. A. Rogers, real estate agent and cattle trader.

Retirement Doubted

With its substantial loans and low losses, the Caledonia has been showing earnings of 10 per cent on its total capital and surplus. Since it was nationalized in 1865 it has missed paying only one dividend, during the 1893 panic, and is now paying six per cent in cash after a 100 per cent stock dividend last January.

However, Mr. Wesson doesn't expect deposits and earnings to continue recent growth, in view of the increase in federal taxes and other operating costs.

Mr. Wesson is now in his early seventies. "I don't think he'll ever retire," said director A. G. May, "although recently we did persuade him to turn over to another man his duties as town clerk of Danville. He had held that job for 47 years and in earlier days he and Mrs. Wesson used to do all the bank's and the town clerk's work in one small building.

Now Mr. Wesson has 10 active co-workers in his modern bank. Their operations are mechanized to the fullest extent practicable. "I guess our equipment is more up-to-date than that of most big city banks," he said. "We only have to buy one of anything."

STRAW INCREASES EARTHWORMS — Earthworm population of soil increased with rate of application of straw in straw mulched plots, according to Nebraska studies. They improved soil structure and indirectly helped boost crop yields.

Other observations:

1. Surface eight inches of soil stubble mulched plots contained two to five times as many earthworms as plots in which the residue was plowed under.

2. Number of earthworms was higher under moist, cool conditions. Under hot, dry or cold conditions they almost disappeared from the surface soil.

3. Close relationship was found between amount of wormcasts produced and earthworm population, although different species formed wormcasts at somewhat different rates.

4. Percolation tests showed rate of water intake was much greater in soil when earthworms were present.

Nebraska Extension Service

BEEF CATTLE

Marketing Alfalfa-Brome ....Jan., 1952
Silage for Beef Cattle .....Feb., 1952
Spuds into Steers .....Feb., 1952
Cheaper Beef Gains .....Mar., 1952
Hormones Lower Beef Costs ..Mar., 1952
Nutrition During Gestation ..Mar., 1952
The Best Steer to Eat Grass..Apr., 1952
Beefmasters .....Apr., 1952
Lowering Beef Cattle Costs ..Apr., 1952
Brangus Cattle .....Apr., 1952
Calving to Market at 15 Mos. May, 1952
Will Feeder Cattle Pay .....Oct., 1952
Make Beef for 14 Cents .....Oct., 1952

CONSERVATION

Tall Fescue for Trouble Spots..Dec., 1951
Flood Control Program .....Jan., 1952
Clean Streams .....Jan., 1952
New Nursery Methods .....Feb., 1952
Ground Cover for Sandy Soils..Apr., 1952
A Valley Is Reclaimed .....Oct., 1952
Earth Takes Big Drink .....Oct., 1952

CROPS

Seed Wheat by Thermometer..Dec., 1951
Hurry-up Seed Plan .....Dec., 1951
Put Boxing Gloves on Your Seeds .....Dec., 1951
Climate Calendar—Crops on Time .....Feb., 1952
Feed Your Forage Crops ....Feb., 1952
Producing Small Grain .....Feb., 1952
How Does Your Corn Grow?..Mar., 1952
Ladino Clover .....Mar., 1952
How to Choose Hybrid Corn..Apr., 1952
More Corn on Less Land ....Apr., 1952
Corn Production .....Apr., 1952
Growing Brome Grass .....May, 1952
A Corn Champion's Story ....May, 1952
Make Corn Your Nurse Crop..May, 1952
Irrigation .....May, 1952
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Red Clover Comes Back .....July, 1952
Costs to Harvest Grass Silage..Oct., 1952

DAIRY CATTLE

Long-Lived Cows .....Dec., 1951
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What If You Miss a Milking..Dec., 1951
Calf Scours .....Dec., 1951
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Improve Butterfat Test .....July, 1952
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New Cure for Trichomoniasis..Oct., 1952
Planning for Dairy Profits ..Oct., 1952
Take Advantage of Architecture of the Cow .....Oct., 1952

FARM BUILDINGS

Barn Ventilation .....Oct., 1951
Cow Comfort and Ventilation..Apr., 1952
Pole Type Poultry Shelter ...Oct., 1952

FARM MANAGEMENT

Keep Your Hired Man .....Nov., 1951
It Takes More Than Money ..Dec., 1951
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Cutting Production Costs ....Mar., 1952
Livestock Bruises Cost Money .....Mar., 1952
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I'll Be Suing You .....May, 1952
Oil Under Your Farm? .....May, 1952
Don't Buy a Fooler Farm ...July, 1952
Lease That Will Last .....July, 1952
All-Risk Crop Insurance .....Oct., 1952
Biggest Cross-Roads Bank ...Oct., 1952

FARM EQUIPMENT and MACHINERY

Winter Care of Machinery ...Dec., 1951
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Whirlwind Milking .....Feb., 1952
Periodic Oil Changes .....Feb., 1952
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FEEDS

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Rotation Fertilization .....Jan., 1952
Mineral Needs of Livestock ..Feb., 1952
Manure—Top Soil Builder ...Mar., 1952
New Soil Conditioner .....Mar., 1952
Get Organic Matter Quick ...Oct., 1952

FORESTRY

Be Your Own Woods Boss ...Mar., 1952
Put the $ Sign on Decay ....Feb., 1952

FRUIT

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Raise Every Pig .....July, 1952
New Antibiotic Pig Pellet ...Oct., 1952
Pastured Pork Costs Less ...Oct., 1952

INSECTS and INSECTICIDES

New Farm Chemicals .....Apr., 1952
Pest Control .....July, 1952

PASTURES

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Irrigate Pastures .....Oct., 1952
Balbo Rye .....Oct., 1952
Cascade Lotus .....Oct., 1952

POULTRY

Cholera in Turkeys .....Dec., 1951
Good Ventilation Pays .....Jan., 1952
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SHEEP and GOATS

Two Lamb Crops a Year ....Nov., 1951
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Increasing Returns From Wool .....Feb., 1952
Parasites Take Sheepman's Profit .....Mar., 1952
Sheep Industry in Ohio .....May, 1952
Money in Sheep .....July, 1952
Breeding, Feeding for Wool .Oct., 1952

SOILS

Improving Tilth .....Nov., 1951
Soil Fertility and Human Nutrition .....Jan., 1952
Soil Fertility and Pastures ..Mar., 1952
Is My Soil Deficient? .....Mar., 1952
Manure—Top Soil Builder ...Mar., 1952
New Soil Conditioner .....Mar., 1952
Is Your Farm Hungry? .....Apr., 1952
Atoms Aid Plant Research ...Apr., 1952
Test Your Soil Vocabulary ...May, 1952
Soil Organic Matter .....July, 1952
Land Judging Contest .....Oct., 1952

VEGETABLES

If You Want Early Tomatoes..Apr., 1951
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WEEDS

Check Your Weed Sprayer ...Oct., 1951
Grub Out Buckthorn .....Dec., 1951
TCA Controls Johnson Grass..Dec., 1951
Don't Put Up With Garlic ...Jan., 1952
Brome Will Strangle Quackgrass .....Jan., 1952
Killing Weeds With Chemicals .....Feb., 1952

MISCELLANEOUS

U. S. Fact-Finders Abroad ...Dec., 1951
Indian John .....Dec., 1951
F.A.O.—Bulwark of Freedom..Jan., 1952
A Long-Drawn Question .....Jan., 1952
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Farm Business Management — By Robertson and Woods. 1951. 546 pages, 248 illustrations. J. B. Lippincott. Prepared for use in all farm management and marketing courses. Combines the most up-to-date and authoritative content with the best farming practices available today in the field of farm management $3.80

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Cowphilosophy — By Mark Keeney. Second edition to which has been added the "Herdsman's Corner" and new material by the author. Fifty per cent larger. Holstein-Friesian World. A best seller since its first appearance in 1939. No agricultural book ever received a more enthusiastic reception from breeders and educators. Many college professors made Cowphilosophy required reading for their advanced classes in animal husbandry $3.00

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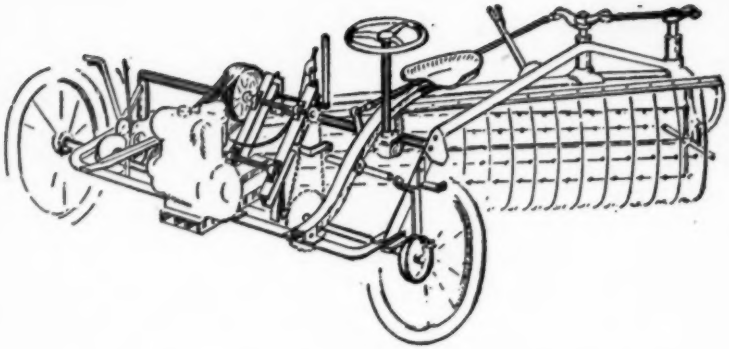

SELF-PROPELLED HAY RAKE

The new machine above marks another step in the development of self-propelled farm implements. Trend has been to mount implements on the tractor to — in effect — create a self-propelled plow, mower or other tool. This new idea goes the other way. It mounts a removable, interchangeable power unit on the wheeled implement.

By mounting an air-cooled engine on the frame of a side-delivery hay rake, adding a steering mechanism, brake and seat, Lee Brothers Manufacturing Company of Russellville, Arkansas, has created an entirely new farm machine. The unit, sold as a complete kit, can be mounted with a set of wrenches, since there are no new holes to drill and no adjustments to make on the original machine.

Converting a standard side-delivery hay rake into a self-sufficient farm machine releases the farm tractor for other jobs during the busy hay season, greatly reduces the cost of raking (manufacturer claims raking 1,000 bales costs only $1.00 in fuel) and reduces the chances of costly break-downs, since the engine is not powerful enough to twist or damage the rake. Kit for standard rakes—Case, John Deere and International—retails for $425.00.